



JAYMOR
INDUSTRIES LTD

Maxi-Miser
NETWORKS

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This manual is intended as a guide for the installation and operation of the Jaymor MAXI-Miser Resaw / Breast-bench Setworks. It is not an instructional manual on operating the sawmill resaw / breast-bench. It is recommended that professional advice be sought for the operation of the resaw / breast-bench and cutting procedures.

We would appreciate any feedback you may have on the layout of this manual. If there is anything you feel should be further explained or added to the manual, please inform Jaymor so that we may continue to improve the information supplied with our systems.

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1. INTRODUCTION

The **JAYMOR MaxiMiser Networks** is the latest in Jaymor Dimension Control equipment technology, incorporating full digital control.

Years of industry involvement have lead to control operations that are streamlined, for fast, efficient and operator sensitive control functions. These control functions and adaptive design philosophies have been developed in conjunction with a number of sawmill operators and sawmilling personnel.

Operator interface is via a custom built operator console incorporating LED displays. These displays show the operator the current position and other relevant information. Set-up calibration, and programming information are easily entered and adjusted from the operator's console, through key press combinations with system parameters password protected to ensure security of the system. The console display can be manually adjusted to suit ambient light conditions. The configuration of the operator console and LED displays allows for simple, fast and accurate setting.

The computer equipment used is industry standard, state of the art computer electronics. The software used is custom designed through the Jaymor Industries In-House Design Facility.

The aim of this manual is to provide a reference to both the operator and the engineer or electrician responsible for the maintenance and service of the networks. It aims to provide the relevant information and is to be used in conjunction with the training already provided by Jaymor personnel.



2. THE OPERATOR'S CONSOLE

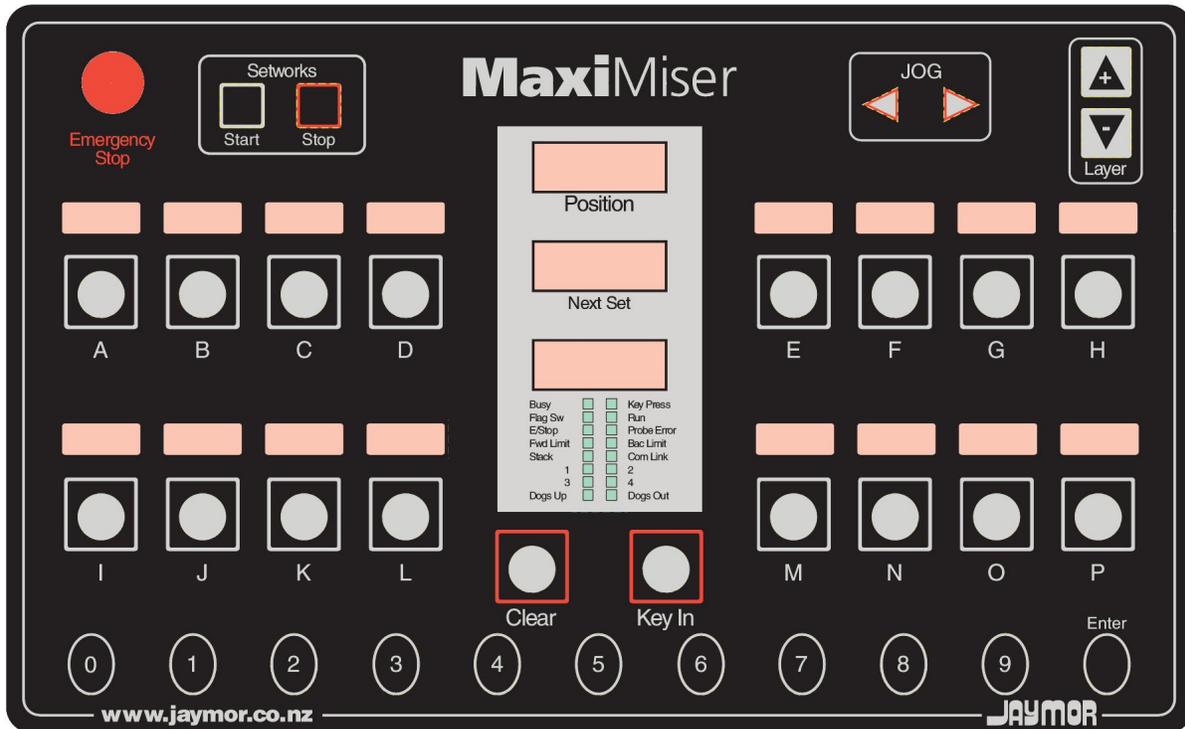
This section provides a brief description of the operator's console of the Jaymor networks. It gives detailed descriptions of the layout and purpose of the displays in the console and how they relate to the status of the system.

The steps required to program the sizes into the preprogram buttons are outlined with examples, and the general operation of the networks is detailed. The setting operations available are explained, as are the functions of the other buttons on the front of the operator's console.



2.1. CONSOLE LAYOUT

The MAXI-Miser console layout is illustrated below:



The functions of the buttons and displays on the operator's console are outlined in the following sections.

2.2. CONSOLE DISPLAYS

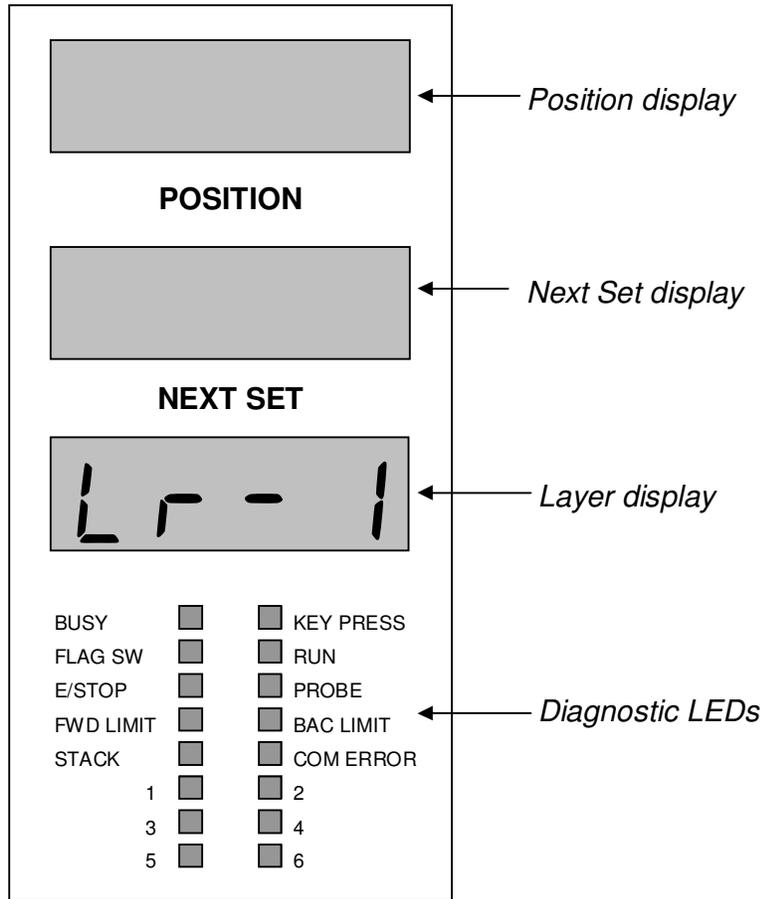


Figure 4.1: Display Layout

There are three 4-digit displays mounted vertically in the centre of the console with 16 status LEDs mounted directly underneath. The brightness of these displays can be adjusted by parameter 23. The displays above the preprogram buttons have two brilliance control parameters and can be used so that the selected size is shown brighter than the others by the "PBD Dim" and "PBD Bright" brilliance parameters (P24 & P25).

The functions of the displays from top to bottom are as follows:

2.2.1. Position Display

In the normal operating mode this display will show the current backset position of the fence at any instant. The backset distance is the distance measured between the saw and the fence / linebar.

In parameter mode the position display will show the parameter number that is to be adjusted.

2.2.2. Next Set Display

This display will show the set value when the operator has selected a preprogram size via a pushbutton or has entered a random size via the random pushbuttons. The value of the last completed set will be constantly shown in the Next Set display until another set is entered or the next entry in the stack is ready to be performed.

If the networks is operated in Stack Set mode, as the sets are completed the Next Set display will update to show the next pending set. Once all sets in the stack have been performed the Next Set display will constantly show the value of the last completed set, and the Stack LED in the diagnostic displays will switch off.

2.2.3. Layer Display

In the normal operating mode this display will show present operating layer number of the preprogram sizes. For example, if the operator is currently working on layer 2, the Layer Display will show:

A digital display showing the text "Lr-2" in a rectangular frame. The characters are in a simple, blocky font. The "L" is on the left, followed by "r", a hyphen, and the number "2".

When a random pushbutton is pressed, this display will show the value of the random number entered. If this number is then programmed to a pre-programmed pushbutton the random number disappears and the Layer number will return. If the "Enter" pushbutton is pressed the random number will shift up to the Next Set or onto the stack, and the layer number will return.

2.2.4. Diagnostic LEDs

The diagnostic LEDs are used to provide the operator with information on the status of the networks. The function of each LED is listed below:

1) **BUSY**

Illuminates when the networks has issued a command to move and is in the process of completing the set. The display remains illuminated until such time as the command has been completed and the set has reached its target. The next command will not be recognised until this light has switched off.

2) **KEY PRESS**

Will switch on when any pushbutton on the membrane is pressed, regardless of whether the operation can be completed at that time or not.

3) **FLAG SW***

This light will switch on when the flag switch is shut, indicating that there is timber in the saw.

4) **RUN ***

Illuminates when the "RUN" signal from the power pack is lost, indicating that the hydraulic power pack has stopped running, and as such not setting will be possible.

5) **EMERGENCY STOP**

Illuminates when the emergency stop button is activated.

6) **PROBE ERROR**

This light will switch on when the connection to the probe or encoder is lost, or if the current reading is outside the range set by Parameters 124 and 125.

7) **FORWARD LIMIT**

Illuminates when the forward limit is reached by the fence / linebar.

8) **BACK LIMIT**

Illuminates when the back limit is reached by the fence / linebar.

9) **STACK ENTRY**

This light will switch on if there is more than one entry in the stack, indicating that there is a set pending the completion of the current set.

10) **COM ERROR***

Illuminates when the communication link to multiple controller systems is lost.

11) **1***

In a two-axis system, this LED will light in conjunction with one of the above lights to indicate the state of Loop 1. For example if Loop1 has a probe error, both the "Probe Error" and "1" will light up.

12) **2***

In a two-axis system, this LED will light in conjunction with one of the above lights to indicate the state of Loop 2. For example if Loop2 has a probe error, both the "Probe Error" and "2" will light up.

* These LEDs may not be implemented depending on the individual networks

The remaining diagnostic LEDs, from 3 to 6, are not implemented on the MAXI-Miser breast bench / resaw.

2.3. PROGRAMMING THE PREPROGRAM BUTTONS (A - P)

Programming the preprogram buttons is a very simply procedure. Programming can be achieved while active in the normal operating mode and is achieved by the following steps:

- 1) Select the layer on which the preprogram size is to be programmed by pressing either layer up or layer down pushbuttons:



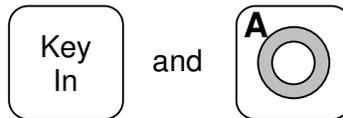
The current layer is shown in the layer display as “Lr x”, where x is the layer number, for example if layer 3 were selected the Layer display would show:



- 2) Enter the size to be programmed through the **RANDOM** pushbuttons (0 – 9). As you select the size the numbers will be displayed in the layer display area of the console display unit.

- 3) Having obtained the correct size to be entered, hold down the **KEYIN** pushbutton while pressing the desired preprogram pushbutton (A - P). The size in the layer display area will disappear, and will appear in the push button display of the altered preprogram button. This indicates that the pushbutton has been programmed or changed.

For example, to program the size into button “A”, the operator would press:



NOTE: Sizes can only be programmed to the nearest millimetre.
 The preprogram button displays indicate the size stored in each button for the current layer.
 If no size is programmed for a particular button on the current layer, its display will show:



2.4. ACTIVATING THE HYDRAULIC POWER PACK

The operator console and displays are active regardless of whether the resaw / breast-bench's power pack is running, although setting operations will not be possible until the power pack is started. This allows the operator to program the preprogram buttons and access diagnostic and set-up menus while the power pack is off.

Pressing the **START** pushbutton on the operator console activates the networks' power pack. This action should be followed by the "**Run**" light of the diagnostic LEDs switching off, this light indicates that the power pack has received the start signal and is now operating.

If the run-confirm signal from the power pack is not received soon after the start request is sent from the console, the start signal will automatically drop out (this will occur within around half a second of the Start button press). This action can be bypassed by setting the "Run Confirm Bypass" parameter (P31) to zero. If the run confirm is bypassed in this manner, the start signal will stay on regardless of the state of the power pack.

NOTE: If the run confirm signal is bypassed, the MAXI-Miser console can no longer tell if the power pack is running and as such may attempt to drive the control valves when the power pack is switched off. It is recommended that the "Emergency Stop" button be used to ensure that all driving signals to the valves are halted when the hydraulics are off preventing possible damage to the valve coils.

2.5. SET MODE

The "Set Mode" parameter (P105) determines the behaviour of the system as it approaches a target. There are four modes to choose from as outlined below.

2.5.1. Normal Set Mode

In Normal Set Mode the networks will set directly to the target in either direction, as long as the distance travelled in the set is greater than the Minimum Set Distance (P106).

If the distance to the target is less than the Minimum Set Distance, the networks will travel back to a distance set by the “Back Up Distance” parameter (P107) beyond the target, and then set forward to the target.

2.5.2. Always Set Forward Mode

In this mode the networks will always travel forward to the target. If the target is behind the current position, or is closer than the Back Up Distance (P107) to the current position, the system will drive back until it is beyond the target by the Back Up Distance. The networks will then travel forward to the target.

2.5.3. Absolute Set Mode

In Absolute Setting Mode the networks will travel directly to the target in either direction, regardless of how close the target may be.

2.5.4. Always Set Backward Mode

In this mode the networks will always travel back to the target. If the target is in front of the current position, or is closer than the Back Up Distance (P107) to the current position, the system will drive forward until it is beyond the target by the Back Up Distance. The networks will then travel back to the target. (This mode is intended for use on Horizontal saws where the weight of the saw can affect the setting characteristics of the system)

2.6. SETTING TO A SIZE

The MAXI-Miser resaw / breast bench can be operated in two modes, selected by the “Setting Mode” parameter (P10). If P10 = “0” the networks will run in “Instant Set” mode, if it is set to “1” the networks will run in “Stack Set” mode.

In some systems a switch is located on or near the fence / linebar called the “Flag Switch”. This switch is used by the networks to indicate when there is timber in the saw, in which case the MAXI-Miser will not allow the fence / linebar to move until the switch is cleared. When the flag switch is activated, the “FLAG” light in the diagnostic LEDs should switch on.

If the system does not include a flag switch, this system can be bypassed by setting the “Flag Operation” parameter (P32 or P33) to “0”.

2.6.1. Stack Set Mode

In this mode the networks will stack up to eight sizes, and execute the sets in the order that they were entered. In Stack Set mode the networks will only perform a set when the flag switch is cleared, indicating that the saw is clear of timber. The first set requested after the “Clear” button has been pressed will occur immediately, with any consequent sets being added to the stack. If there is more than one entry in the stack the “STACK” light of the Diagnostic LEDs will turn on.

The Next Set display will show the set at the bottom of the stack until the set is performed, it will then show the value of the next set in the stack. This value will be displayed until the flag switch has been activated and then cleared, indicating that the cut has been made. The networks will then automatically set to the next size in the stack and update the Next Set display. This allows the operator to program eight cuts in advance.

Pressing the CLEAR pushbutton at any time empties the stack and prepares the system to set to the next size entered into the bottom position of the stack as long as the flag switch is cleared.

2.6.2. Instant Set Mode

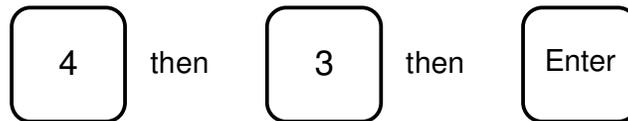
In this mode the networks will execute the set as soon as the preprogram button is pressed, or as soon as flag switch is cleared. No sizes are stacked in this mode and the flag switch does not have to be activated in between sets before the next set will be processed.

If there is timber in the saw and the flag is activated when the set is requested, the networks will wait until the flag clears, and then perform the set automatically. This allows the operator to anticipate one cut ahead of the timber currently in the saw.

2.6.3. Random size entry

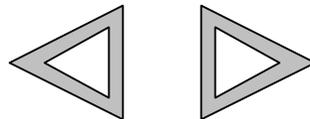
If a one-off set size is required that is not stored in the preprogram buttons, a random set can be performed. If the operator enters a number via the random pushbuttons and then presses “Enter”, the size will be added to the bottom of the stack. If the setworks is in Instant Set Mode, the set will be performed immediately or as soon as the flag switch is cleared.

For example, to enter a random set of 43mm, the operator will press:



2.7. JOGGING OPERATIONS

The fence / linebar of the system can be “jogged” to any desired position by using the Jog In and Jog Out buttons on the console. This action will move the fence in the desired direction for as long as the button is held down.



The direction of the two arrow buttons can be swapped via the “Jog Button Invert” parameter (P4) to suit the individual set up of each system.

As with setting operations, jogging is limited by the state of the flag switch, i.e. it is not possible to jog when there is timber in the saw. In some systems it is desirable to be able to jog out when the flag is activated in order to clear jammed timber. This is possible if the “Jog Back Flag Override” parameter (P34) is set to “0”, otherwise all operations will be halted by the flag switch.

2.8. REALIGNING THE AXIS (MULTI AXIS SYSTEMS ONLY)

In a multi-axis system where the axes are supposed to remain in line at all times, an error will be generated if the difference between the axes exceeds the “Crash Tolerance” parameter (P14). This will prevent the system from racking too far and possibly causing damage. When the Crash Tolerance distance is breached due to a mechanical fault or poor tuning of the system, the alignment error will appear in the Next Set display as shown below:



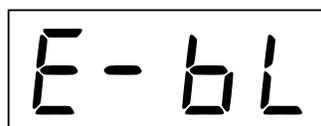
ALIN

To realign the axis, the operator can press the Retract button, which will give the axis that is further extended the target position of the other axis. Alternatively, the operator can use the Jog buttons to bring the axis into line, although it may not be possible to exactly align the axis in this manner.

2.9. LIMIT PARAMETERS

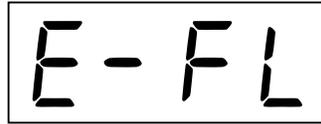
There are two limit parameters that are used by the MAXI-Miser networks to prevent the operator from accidentally setting to a position beyond the physical limits of the system. If the operator attempts to set to a distance beyond the value set in the limit parameters, the fence will not move and an error message will be displayed.

The Back Limit error will display whenever the requested target would cause the fence / linebar to retract beyond the distance set in the “Back Limit” parameter (P111). This limit ensures that the fence will never travel further out than the limit when completing a set.



E-bl

The forward limit distance is the minimum distance that can be set to and is used to prevent the fence / linebar from entering the saw-line. This distance is set by the “Forward Limit” parameter (P112).



The displayed errors will be removed when any button on the console is pressed.

Parameter 110, “Limit Type”, will determine the type of limits that the MAXI-Miser will use to control the system. If this parameter is set to “1” (No Limits) the MAXI-Miser will automatically determine the limits of the system by setting the Forward Limit equal to the Probe Offset, and the Back Limit equal to the Probe Offset plus the Probe Stroke. In this mode it is not possible to alter the value of the limit parameters.

If the Limit type is set to “2” (Manual Limits), then the limits of the system are set by the operator, although the Forward Limit cannot be set to less than the Probe Offset distance.

2.10. EMERGENCY STOP

The use of properly designed safety circuits external to the Jaymor electronics will protect against both equipment damage and human injury. Every industrial control application involving electrical or moving parts should be wired with an emergency stop circuit. The emergency stop circuit should turn off the power immediately to all output devices in the system. The emergency stop circuit should provide independent power cutoff from the Miser control system.

The function of the Emergency stop button is to cease all outputs from the networks to the resaw / breast-bench and cancel the current operation(s). The operation of the Emergency Stop button will also stop the hydraulic power pack of the system if it is controlled from the MAXI-Miser console.

The MAXI-Miser console is wired to allow for the implementation of an external Emergency Stop as shown in Appendix A.6.

3. NETWORKS MODE DESCRIPTION

This section of the manual details the steps involved in changing the parameters of the networks. This is a function that is not required in the general day-to-day running of the system, but is accessed to customise the networks to the individual system.

Also outlined is the operation of the “Warm Up Cycle” functions. These may or may not be relevant to the system and are intended for hydraulic systems where the oil needs to be brought up to temperature before accurate setting can be achieved.

There is an explanation of the error messages the operator may find during operation of the system and a detailed description of the limit parameters used to restrict the movement of the axis to prevent any mechanical damage from occurring.



3.1. PARAMETER MODE

This mode is activated during commissioning or when any of the system parameters require adjustment.

Parameter mode is entered via the following steps:

- 1) Press and hold down the **KEYIN** pushbutton while at the same time press the **LAYER UP** pushbutton, then release both buttons. The networks may prompt the operator to enter the security code for access to the parameter mode. The Position display will show "**Pin**".
- 2) Enter the appropriate PIN number via the random pushbuttons (0-9). The Layer display will show a "-" every time a key is pressed (a maximum of 4 numbers is accepted). The Pin access code for the MAXI-Miser console is **9290**. Press Enter.

If the incorrect PIN number is entered an "**Err 1**" message is temporarily displayed in the Layer display. The operator is returned to the main operating mode and must restart this procedure.

- 3) If the correct PIN number has been entered, "**P**" will be displayed in the Position display. Enter the required parameter number via the random pushbuttons (0 - 9). As the random numbers are pressed they will be displayed in the Layer display. Press Enter to select the parameter.

(Refer to **Appendix D**: Parameter Listing)

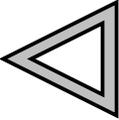
The parameter number will be displayed in the Position display with the current value of the selected parameter will be displayed in the Layer display. This will only occur if the parameter number entered is a valid parameter.

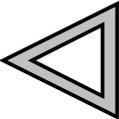
- 4) To adjust the parameter value, press the **LAYER UP** or **LAYER DOWN** pushbuttons. This will increase or decrease the parameter value one unit at a time, respectively.

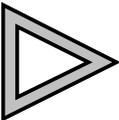
To change the parameter in larger increments, the layer buttons can be pressed in conjunction with other buttons as outlined below:

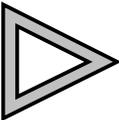
Hold  and press  The parameter will **increase by 10** units at a time.

Hold  and press  The parameter will **decrease by 10** units at a time.

Hold  and press  The parameter will **increase by 100** units at a time.

Hold  and press  The parameter will **decrease by 100** units at a time.

Hold  and press  The parameter will **increase by 1000** units at a time.

Hold  and press  The parameter will **be set to its minimum** value.

5) Having adjusted the parameter to the required value press the ENTER pushbutton to save the new value. The letter "P" will show in the Position display, as before, ready for the next parameter number to be entered.

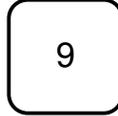
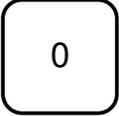
6) When finished, press the CLEAR pushbutton to return the operator to the main operating mode.

As an example, the Probe Offset is Parameter 122. If the operator needs to change the value of the offset from 10.5mm to 11.0mm they would follow the following procedure:

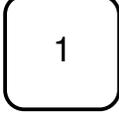
- 1) Enter Parameter Mode

Key In and   POSITION

- 2) Enter the PIN (if required)

    then   POSITION

- 3) Enter the Parameter number

   then   POSITION

 NEXT SET



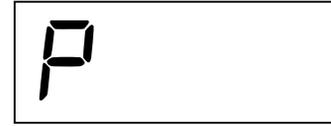
- 4) Use the layer buttons to alter the parameter value to 11.0mm

   POSITION

 NEXT SET



- 5) Press the "Enter" button to return to the parameter selection stage



POSITION

- 6) Press "Clear" to return to the normal operating mode



3.2. FUNCTION MODE

To access Function Mode:

- 1) Press and hold down the **KEYIN** pushbutton while at the same time press the **LAYER DOWN** pushbutton, then release both buttons. The networks may prompt the operator to enter the security code for access to the parameter mode. The Position display will show "**Pin**".
- 2) Enter the appropriate PIN number via the random pushbuttons (0-9). The Layer display will show a "-" every time a key is pressed (a maximum of 4 numbers is accepted). The Pin access code for the MAXI-Miser console is **9290**. Press Enter.

If the incorrect PIN number is entered an "**Err 1**" message is temporarily displayed in the Layer display. The operator is returned to the main operating mode and must restart this procedure.

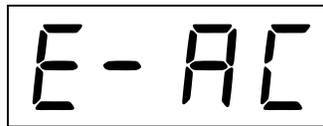
- 3) If the correct PIN number is entered, "**F**" is displayed in the Position display. This is a prompt for the operator to push a Preprogram pushbutton and activate the required function, which will then be activated automatically.
- 4) Once the function has begun its operation, the operator will be returned to the main operating mode automatically, with the layer display indicating which function was performed. The function's operation can be cancelled, and the layer display cleared, at any time by pressing the CLEAR pushbutton.

The only available function on the MAXI-Miser console is Auto Calibrate as outlined below.

3.2.1. Function A – Auto Calibrate

The auto calibrate function is used at the time of commissioning to calibrate the probe / encoder to the physical setup of the system.

Auto calibrate is only available if the “Auto Calibrate Inhibit” parameter (P13) is set to “1”. If an Auto Calibrate operation is attempted with this parameter set to inhibit, an Auto Calibrate Error is generated, the operator will be returned to the normal operating mode and the Layer display will show the following message:



The image shows a digital display with the text "E-AC" in a stylized, segmented font. The characters are enclosed within a thin black rectangular border.

When the Auto Calibrate function is entered, the operator may be prompted to enter the loop number that the function will be run on. This will only occur for multi-axis systems. If this is the case, the operator should enter the loop number via the random number keypad and press enter.

The displays in the center of the console will then show “**ACAL run bAC**” indicating that the function is ready to start and run the ram of the networks backward. To begin the calibration the operator will push Enter.

The MAXI-Miser will then drive the ram backward and provide a countdown in the Layer display. After 10 seconds the layer display will display the number of counts that are received from the ram at this position. The operator should note the position of the fence / linebar at this point by either marking the ram or measuring its distance from a fixed point. Enter should then be pressed to accept the count value and proceed with the calibration.

The center displays will show “**ACAL run For**” to indicate that the ram is about to be driven forward. Once the operator presses Enter, the layer display will again show a countdown while the ram is driven forward. A count value will be returned for this position of the ram and the operator should again note the position of the ram.

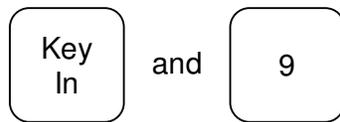
When Enter is pressed at this stage, the operator is sent to Parameter Mode to enter the distance the ram covered during calibration as the “Probe Stroke” parameter (P123). This

distance is calculated from the two measurements that were recorded during the calibration.

The parameter is adjusted using the Layer buttons, as usual and is stored by pressing Enter. The operator is returned to normal operating mode by pressing Clear.

3.3. WARM UP CYCLE

The warm up cycle of the setworks will run the fence / linebar in and out continually to heat up the hydraulics of the system and result in more stable operation. The cycle is activated by pressing and holding the Key In button while at the same time pressing the “9” button, then releasing the two together.



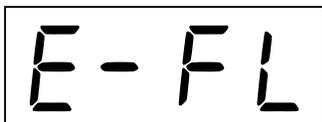
The warm up cycle will be cancelled by pressing any other button on the MAXI-Miser console.

3.4. ERROR MESSAGES

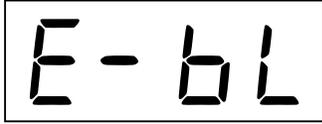
The MAXI-Miser console will display various error messages whenever the operator performs an illegal operation. The error messages and their meanings are outlined below:



This message is shown when the operator has entered the incorrect PIN number to enter either Function or Parameter Mode. The message will be displayed in the Layer display for approximately 2 seconds.



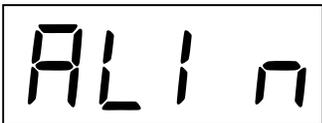
This message is displayed over the positional data if the requested set would have caused the axis to travel beyond the Forward Limit (P112 for Rise/Fall, P212 for Sideshift) of the system.



This message is displayed over the positional data if the requested set would have caused the axis to travel beyond the Back Limit (P111 for Rise/Fall, P211 for Sideshift) of the system.



This message is displayed when the control for Loop1 (Rise/Fall) is passed a target it cannot reach without breaching a limit. This message should not occur during normal operation and is used by Jaymor for debugging purposes. “**E-L2**” is the corresponding error for Loop 2 (Sideshift).



This error will only occur in multi-axis systems, and is used to indicate that the two axes have racked beyond the Crash Tolerance (P14) of the system and are out of alignment. This message will appear in the Next Set display until the axes are realigned.

4. CALIBRATION AND TUNING

This section outlines the necessary steps to calibrate the position reading device for the system, either a wire rope encoder, or a transducer in a ram. These steps combined with the offset calculation examples give the operator a knowledge of how to recalibrate the system should either of these position sensors ever need replacing.

Also included in this section is a description of the tuning parameters available in the system to adjust and refine the setting characteristics of the networks.



4.1. PROBE / ENCODER CALIBRATION

The probe / encoder will be calibrated when the networks is commissioned. If for some reason the calibration needs repeating the easiest method is via the “Auto Calibrate” function as outlined in the “Functions” section.

Auto calibrate is not suitable for some systems where damage may occur if a drive signal is applied when the knees are at full extension (for example a chain-driven system). For a system such as this the recalibration must be done manually as outlined in the following steps:

- 1) Run the ram to its full extension. This may have to be done manually, to prevent the forward limits from restricting the movement. When at full extension note the value of Parameter 199 (Loop1 Probe Counts), also note the position of the ram as this will be required when calculating the Stroke of the system.
- 2) Retract the ram as far back as it will travel - this may also have to be done manually. Note the value of Parameter 199 (Loop1 Probe Counts) and again note the position of the ram.
- 3) Calculate the distance covered when travelling between full extension and full retraction. This value will be the stroke of the probe (Parameter 123).
- 4) Enter the Probe Count values obtained from the above steps into the appropriate parameters, with the larger count value entered into “Probe Max Counts” (P124), and the lesser value entered as the “Probe Minimum Counts” (P125). This will complete the calibration operation.

Note: The method shown above is specific to the calibration of Loop1. Loop2 can be calibrated in the same manner, but will involve different parameter numbers as outlined in the parameter list.

4.2. OFFSET ADJUSTMENT

The offset distance for the networks is illustrated below:

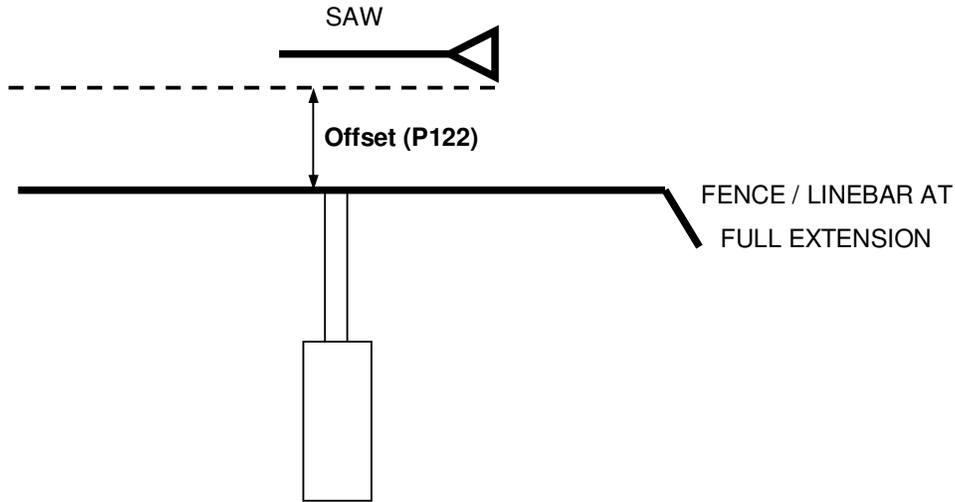


Figure 5.1: Bird's eye view of the breast-bench / resaw ram

The networks' offset distance is stored in **Parameter 122**. This is the measured distance from the fence to the saw when the ram is fully extended as shown in the diagram above.

The Offset may need to be adjusted if the measured size of the board cut and the size shown in the position display of the console do not match. To correct the error in the Offset distance then the difference between the measure size and that in the position display should be calculated, then:

- If the measured size is **too big** – **INCREASE** the offset by the difference between the two amounts.
- If the measured size is **too small** – **DECREASE** the offset by the difference between the two amounts.

Refer to Section 3.1 of this manual for more details on how to adjust a parameter.

4.3. CONSOLE PARAMETERS

The Jaymor MAXI-Miser networks has a number of features that the operator may wish to change which alter the way the console behaves and / or appears. The functions and their descriptions are outlined below.

4.3.1. Display Rounding (P1)

The rounding of the Position display can be turned on and off by adjusting parameter 1. It is recommended that the rounding be left ON under normal operating conditions, as the position can flick between 0.1 mm, which can be distracting to the operator.

4.3.2. PIN Required (P2)

When the operator enters into Parameter or Function Mode, they will be asked to enter a PIN number. It is possible to set the “PIN Required” parameter (P2) to protect the parameter list of the MAXI-Miser from unwanted tampering.

If this parameter is set to “0”, the operator will require a PIN every time they enter Parameter or Function Mode. This can be frustrating if many parameters are to be altered, but is a useful of protecting the working parameter list of the system.

If the PIN Required parameter is set to “1”, the operator will only be required to enter a parameter once after the console has been powered up. Every time Parameter or Function Mode is entered after this, the operator bypass the PIN entry stage and go directly to the Parameter Selection stage.

4.3.3. Matrix Filter Counter (P3)

The sensitivity of the buttons on the console can be adjusted by the Matrix Filter Counter parameter (P3). The higher this parameter is set the less sensitive the buttons will be and the less likely accidental button presses will be.

4.3.4. Display Brightness (P23, 24, 25)

The brilliance level of the displays on the MAXI-Miser console can be altered by the “Display Brightness” parameters. This parameter allows the operator to adjust the displays to compensate for the ambient lighting conditions by increasing or decreasing their brightness.

The pushbutton displays above the preprogram buttons can be set up to highlight the selected size. The displays’ brightness is set by the “PBD Dim Brilliance” parameter (P25) until the corresponding size is selected, when it changes to the “PBD Bright Brilliance” parameter (P24) value. The highlighting of the selected sizes can be avoided by setting parameters P24 and P25 to the same value.

4.4. NON-PROPORTIONAL TUNING (RELAY MODE)

Non-proportional setting can be selected for the system by setting the “Output Drive Select” parameter (P130) to 1 or “Relay Mode”. A Non-Proportional system is a relatively simple system to tune, as the networks’ outputs are either fully on or fully off. The setting behaviour of such a system can be adjusted for more efficient cutting by the following parameters.

4.4.1. Minimum Set Distance

If the networks is operating in “Normal Set Mode” (as outlined in Section 2.5) the Minimum Set distance (P106) will set the smallest distance that will be directly set to without the system performing a Back Up action.

4.4.2. Back Up / Slow Distance

The Back Up distance (P107) is used when in Normal or Step Up setting modes (as outlined in Section 2.5) to set the distance that the system will back up before setting forward to the target.

In a **Two-Speed** system this parameter will also define the distance from the target at which the Slow Valve will become energised.

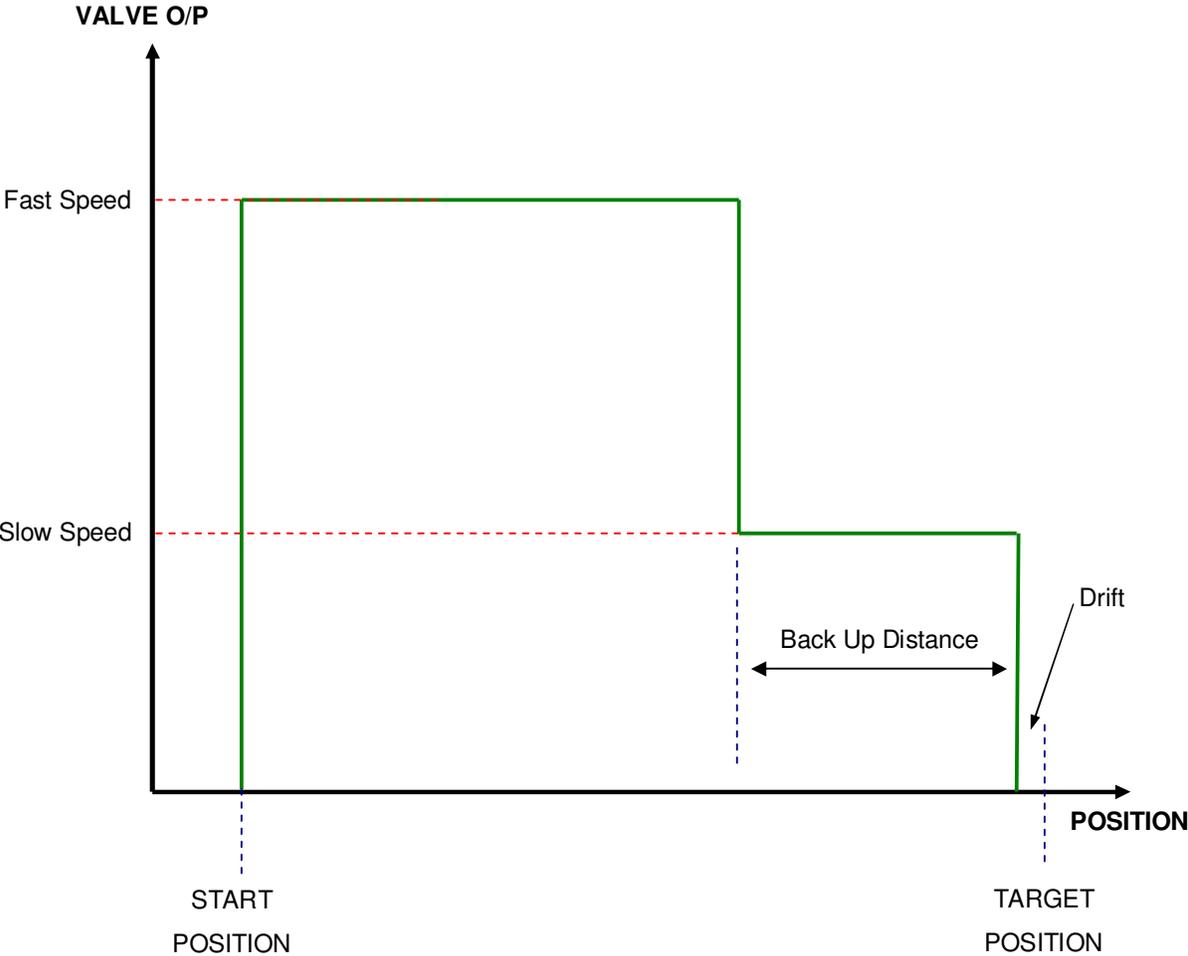
4.4.3. Drift Distance

The Drift parameters (P140 & P150) determine the distance from the target that the valve will be deenergised, allowing the inertia of the system to complete the set. This parameter will tune the accuracy of the system when reaching target.

4.4.4. Slow Valve Delay (2-Speed Systems only)

The Slow Valve Delay (P37) will determine how long after the main directional valve the slow valve will deenergise. This extra time delay is used to prevent the fence / linebar from surging forwards as can occur when both the main directional valve and the slow valve are switched off at the same time.

The graph below illustrates a typical set for a 2-Speed system:



4.5. PROPORTIONAL TUNING

A Proportional system has many more parameters involved in the setting control and is much more complex than a Non-Proportional system. It is not recommended that the tuning of a Proportional system be altered unless the operator is confident with the effects that the following parameters have on the response of the system.

4.5.1. Deadband

The Deadband parameters (P141 & P151) defined the amount of signal that needs to be applied to the valve before any response can be detected. As such, the deadband percentage is added to all other calculations of the driving signal.

If the deadband is set too low, the setpoints will be slow to respond and may also have trouble reaching the target.

If the deadband is set too high, the setting of the system can be very harsh, with the set stopping very abruptly when the target is reached. In Closed Loop, a high deadband may cause the fence / linebar to oscillate about the target.

4.5.2. Ramp Up

The acceleration of the fence / linebar from a stand still to its Maximum Speed is determined by the Ramp Up parameters (P144 & P154). These parameters define the increase in valve output per millimetre travelled in the set. The higher the value of this parameter, the faster the ram will reach maximum speed and as such, the more suddenly the set will begin.

A lower value of Ramp Up will cause a softer ramp to full speed, but if the value is too low it may prevent the system from reaching top speed at all and cause the time taken to perform a set to become too long.

4.5.3. Ramp Up Boost

The Ramp Up Boost parameter (P133) defines the extra percentage output added to the Deadband value to start the ram moving more quickly from a stand still. The system will then ramp up to full speed from this value instead of from the lower Deadband value. If the Ramp Up Boost is set too high, the set may begin too harshly, but if it is too low the system can be slow to respond at the start of a set.

The Ramp Up Boost parameter only effects the initial start up speed of the fence / linear during a set.

4.5.4. Maximum Speed

The maximum speed of the ram when setting forward and backward are determined by parameters 145 and 155. When jogging in and out the maximum speeds are limited by parameters 148 and 158. These parameters set the maximum output speed the ram can reach when performing a set or jog operation.

If the Maximum Speed parameters are set too high the system can have trouble slowing down in time to reach target and may overshoot. If the parameters are set too low, the time it takes to perform a set can become too slow for efficient cutting.

4.5.5. Ramp Down

The ramp down parameters determine the deceleration rate of the ram when performing a set or jog operation. The Ramp Down parameters set the reduction rate in valve output from the Maximum Speed to a stop. The higher the value of the ramp down parameters, the more quickly the ram will reduce speed although this may cause the ram to overshoot its target. If the parameter is set too low, it can prevent the system from reaching full speed, as it will begin to slow almost immediately after the set begins, thus slowing the time taken to perform a set.

4.5.6. Ramp Down Boost

The Ramp Down Boost parameter (P134) is used in a similar manner to the Ramp Up Boost, but defines the output level that the valve will switch off at after a set. This parameter speeds up the set as the system doesn't ramp all the way down to the deadband value, and will stop from a greater speed. If this parameter is set too high it can cause the system to overshoot the target or require the Drift value to be increased.

4.5.7. Drift Distance

The Drift parameters (P140 & P150) determine the distance from the target that the valve will be shut off. This parameter will tune the accuracy of the system when reaching target.

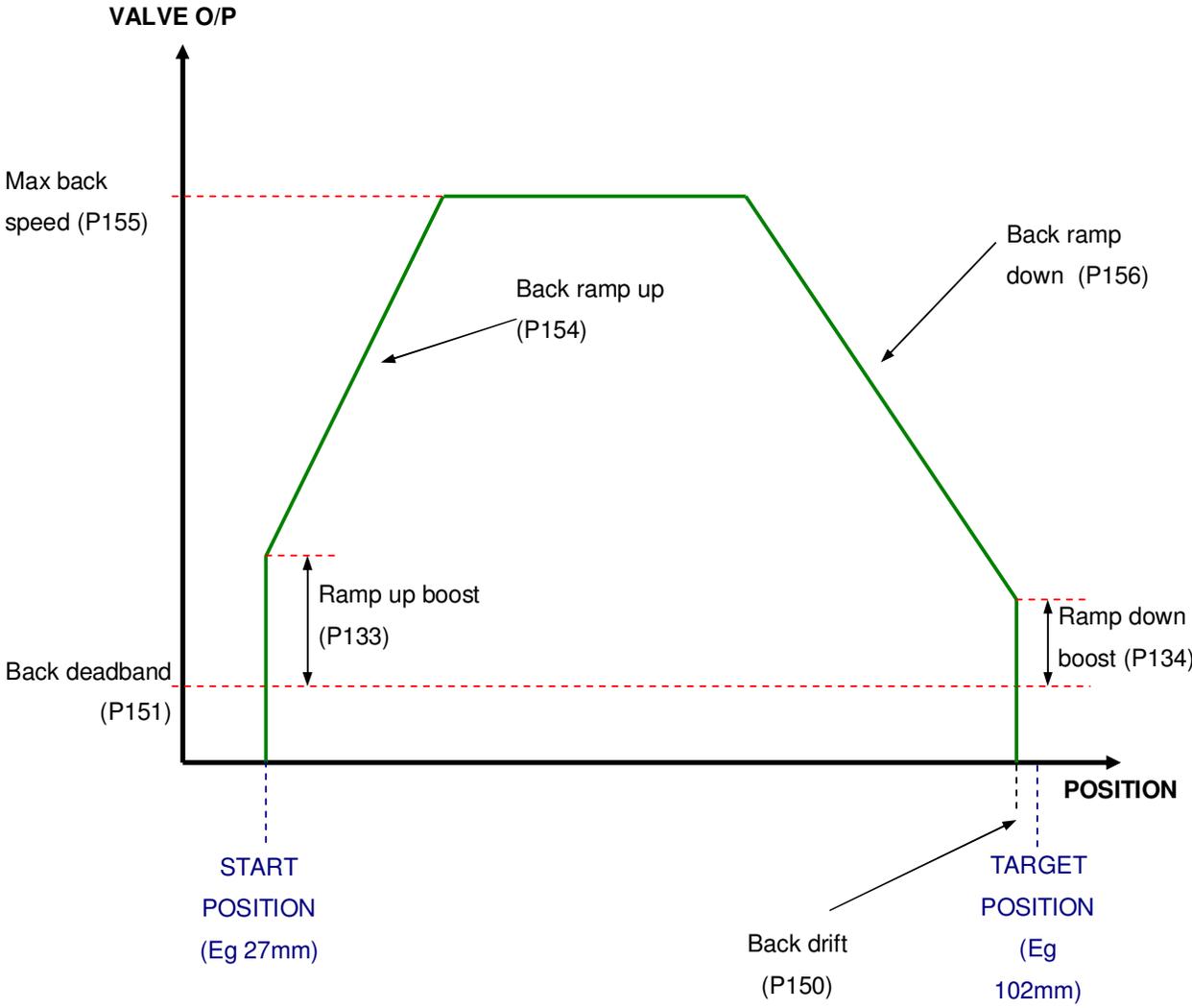
In an Open Loop system, the inertia of the system will complete the set by drifting into the target. If the value is too high the system may fail to reach target, but if it is too low the system will overshoot.

In a Closed Loop system, the PID parameters will be used to drive the fence / linebar to the target.

4.5.8. Overview of Setting Parameters

The effects of all of the above parameters are outlined in the diagrams below. The parameter numbers for different parts of the setting process are given in brackets.

Setting back from a small size to a larger size



5. TROUBLESHOOTING

The troubleshooting section of the manual outlines a few of the common faults experienced due to incorrect setup or operation of the networks. It is recommended that this chapter be consulted before contacting Jaymor technicians for assistance.



5.1. FENCE MOVES WHEN TIMBER IS IN THE SAW

Cause 1: There is no Flag Switch present on the system.

Solution: There is no way for the MAXI-Miser to tell if there is timber in the saw without a Flag Switch. In this case, a set can be performed at any stage and the operator must be careful not to request a set when there is timber in the saw.

Cause 2: The Flag input to the MAXI-Miser has been bypassed.

Solution: Check the “Flag Operation” parameter (P32 or P33) and make sure it is not set to “0 = Bypass”.

Cause 3: The physical switch is not being operated on the fence / linebar.

Solution: Operate the Flag Switch manually and confirm that the Diagnostic LED “Flag” turns on while the switch is activated.

Cause 4 Jog Out pressed

Solution: If the “Jog Back Flag Override” parameter (P34) is set to “1” it is possible to Jog Back when the Flag has been activated. If this is an unwanted feature the parameter should be set to “0”.

5.2. CANNOT CHANGE A LIMIT PARAMETER

Cause 1: If the operator is unable to change any of the limit parameters for the system, it is likely that the “Limit Type” parameter (P110) is set to “1” (No Limits).

Solution: Set parameter 110 to “2 = Manual Limits”. The operator can then alter all limit parameters manually, in the usual manner.

5.3. CANNOT PERFORM THE AUTO-CALIBRATE FUNCTION

Cause 1: The “Auto-Calibrate Inhibit” parameter (P13) is set to “0”, inhibiting the function.

Solution: Set parameter 13 to “1 = Auto-Calibrate allowed”.

Cause 2: The Emergency Stop button is latched ON.

Solution: Release the Emergency Stop button.

5.4. FENCE / LINEBAR OSCILLATES ABOUT THE TARGET

Cause 1: The Deadband parameters are set too high.

Solution: Reduce the deadband parameters (P141 & P151) until the oscillation is eliminated.

Cause 2: The PID position hold parameters are set too high (Closed Loop only).

Solution: Contact Jaymor for help in reducing these PID parameters.

Note: Care should be taken to ensure that the overall setting of the system is not compromised by any alterations made.

5.5. SYSTEM IS SLOW TO RESPOND TO A SET

Cause 1: The deadband parameters are set too low.

Solution: Raise the appropriate deadband parameter (P141 or P151) depending on which direction is slow to respond.

Cause 2: "Ramp Up Boost" parameter (P133) is set too low.

Solution: Raise parameter 133 to increase the initial step up for the set. If this parameter is set too high the system may be too harsh when starting a set.

Cause 3: "Ramp Up" parameters (P144 & P154) are set too low.

Solution: Raise the appropriate ramp up parameter depending on which direction is slow to begin a set.

Cause 4: There is a mechanical fault with the system.

Solution: Check over the mechanics of the system to determine the cause of the fault.

Note: Care should be taken to ensure that the overall setting of the system is not compromised by any alterations made.

5.6. SYSTEM DOES NOT REACH TARGET AFTER A SET

Cause 1: Deadband parameter (P141 or P151) is set too low.

Solution: Raise the appropriate deadband until target is reached consistently.

Cause 2: “Ramp Down Boost” parameter (P134) is set too low.

Solution: Raise parameter 134 until target is reached consistently.

Cause 3: The PID position hold parameters are set too low (Closed Loop only).

Solution: Contact Jaymor for help in reducing these PID parameters.

Cause 4: “Drift Distance” parameter (P140 or P150) needs adjustment.

Solution: Adjust the appropriate drift parameter until the target is reached consistently.

Note: Care should be taken to ensure that the overall setting of the system is not compromised by any alterations made.

5.7. DIAGNOSTIC LED “KEY PRESS” ALWAYS ON

Cause 1: One of the buttons in the membrane has become stuck.

Solution: Press every button on the membrane repeatedly in an attempt to locate and free the faulty button. If the problem persists then contact Jaymor.

5.8. DIAGNOSTIC LED “FLAG” IS ALWAYS ON

Cause 1: The Flag switch on the fence / linebar is jammed on.

Solution: Examine and operate the Flag switch manually, checking that the Diagnostic LED is only on when the switch is activated.

Cause 2: There is no Flag switch present in the system but the “Flag Operation” parameter (P32 or P33) has not been set to “Bypass”.

Solution: Set flag operation parameter to “0” to bypass the flag operation.

Cause 3: The cable between the Flag switch and MAXI-Miser console has a break in it.

Solution: With reference to the cable schedule in the back of this manual, check the “Flag” and “24/0V” lines for continuity.

5.9. DIAGNOSTIC LED “RUN” IS ALWAYS ON

Cause 1: The cable from the power pack’s contactor to the MAXI-Miser console has a break in it.

Solution: With reference to the cable schedule in the back of this manual, check the “Run” and “24/0V” lines for continuity.

Cause 2: The power pack is not running.

Solution: Check that the isolating switch for the power pack is on. Start the power pack from the MAXI-Miser console as usual.

Cause 3: The run confirm signal is not utilised in this system, but the “Run Confirm Bypass” parameter (P31) has not been set to “Bypass”.

Solution: Set parameter 31 to “0” to bypass the run confirm signal.

5.10. DIAGNOSTIC LED “E/STOP” IS ALWAYS ON

Cause 1: There is a fault in the wiring inside the MAXI-Miser console.

Solution: Open the console and check the terminals at the back of the “Emergency Stop” pushbutton. If unable to locate the fault then contact Jaymor for further assistance.

5.11. DIAGNOSTIC LED “PROBE” IS ALWAYS ON

Cause 1: The “Probe Type” parameter (P120) has not been set correctly.

Solution: Refer to the complete parameter list in the rear of this manual and set parameter 120 to the appropriate value for the system.

- Cause 2: There is a break in the cable from the probe to the MAXI-Miser console.
Solution: With reference to the cable schedule in the rear of this manual, check the continuity of the "Probe" cable.
- Cause 3: The fence / linebar has extended the probe beyond the maximum / minimum count parameters as set during the last probe calibration.
Solution: Check the value of the appropriate "Probe Reading" parameter (P199) and compare this to the "Maximum Counts" (P124) and "Minimum Counts" (P125) parameters. If these parameters have been exceeded, the mechanics of the system may have changed and as such the probe may need recalibrating.
- Cause 4: There is a fault with the probe / encoder.
Solution: Contact Jaymor for further assistance with the fault.

5.12. POWER PACK WILL NOT RUN

- Cause 1: The "Run Confirm" signal is not being received from the power pack.
Solution: Check the continuity of the "H/W I/O" cable as outlined in the cable schedule. If the run confirm signal is not utilised in this system ensure parameter 31 is set to "0" to bypass the signal.
- Cause 2: The Emergency Stop button is latched on.
Solution: Release the Emergency Stop and retry starting the hydraulics.

5.13. THE FENCE / LINEBAR DRIVES IN THE WRONG DIRECTION

- Cause 1: The directional valves are on the wrong way around.
Solution: If there is a separate lead to each directional valve, simply swap the two plugs over. Failing this, it is possible to invert the valve output by adjusting parameter 131.

5.14. BUTTONS ARE NOT SENSITIVE ENOUGH

Cause 1: The “Matrix Filter Counter” parameter (P3) is set too high.

Solution: Reduce parameter 3 until the sensitivity of the buttons is at an acceptable level. Try not to reduce this parameter below the optimum level for the desired sensitivity, as it will provide filtering against electrical noise for the system.

5.15. JOG ARROWS ARE AROUND THE WRONG WAY

Cause1: The “Jog Button Invert” parameter (P4) has not been set correctly.

Solution: Adjust parameter 4 to correct the output direction for the Jog arrows.

5.16. THE NETWORKS WILL NOT SET

Cause 1: The power pack is not running.

Solution: The run confirm is not being received, check the possible solutions in Section 5.9 above.

Cause 2: The “Networks Type” parameter (P5) has not been set correctly.

Solution: Check parameter 5 has been set to the appropriate value for the system.

Cause 3: The Emergency Stop button is latched on.

Solution: Release the Emergency Stop button and ensure the power pack is running.

Cause 4: The networks is still busy from the previous set.

Solution: If this is the case, the diagnostic LED “Busy” will still be lit. If this is the case then consult Sections 5.5 & 5.6 to determine why the previous set wasn’t finished.

Cause 5: The Flag switch is on.

Solution: If this is the case, the diagnostic LED “Flag” will be illuminated. If this is the case consult Section 5.8 to determine the possible cause.

5.17. CLEAR MUST BE PRESSED BETWEEN SETS

Cause 1: The system does not utilise a Flag switch but is in “Stack Mode.

Solution: Change the “Setting Mode” parameter (P5) to “2 = Instant Set”.

5.18. THE DISPLAYS ON THE CONSOLE ARE OFF

Cause 1: The console’s isolating switch has been turned off.

Solution: Turn on the isolator for the console.

Cause 2: The plugs for the displays on the MSR1-0 controller board in the MAXI-Miser console have become loose.

Solution: Check that all plugs on the control board inside the console are sitting correctly on their headers.

Cause 3: There is a faulty power supply in the MAXI-Miser console.

Solution: Contact Jaymor for further assistance with this fault.

APPENDICES

This section contains technical information about the Jaymor MULTI-Miser networks. It contains the Cable Schedule for the interconnecting leads to the console and technical notes for the MSR1-0 controller and matrix.

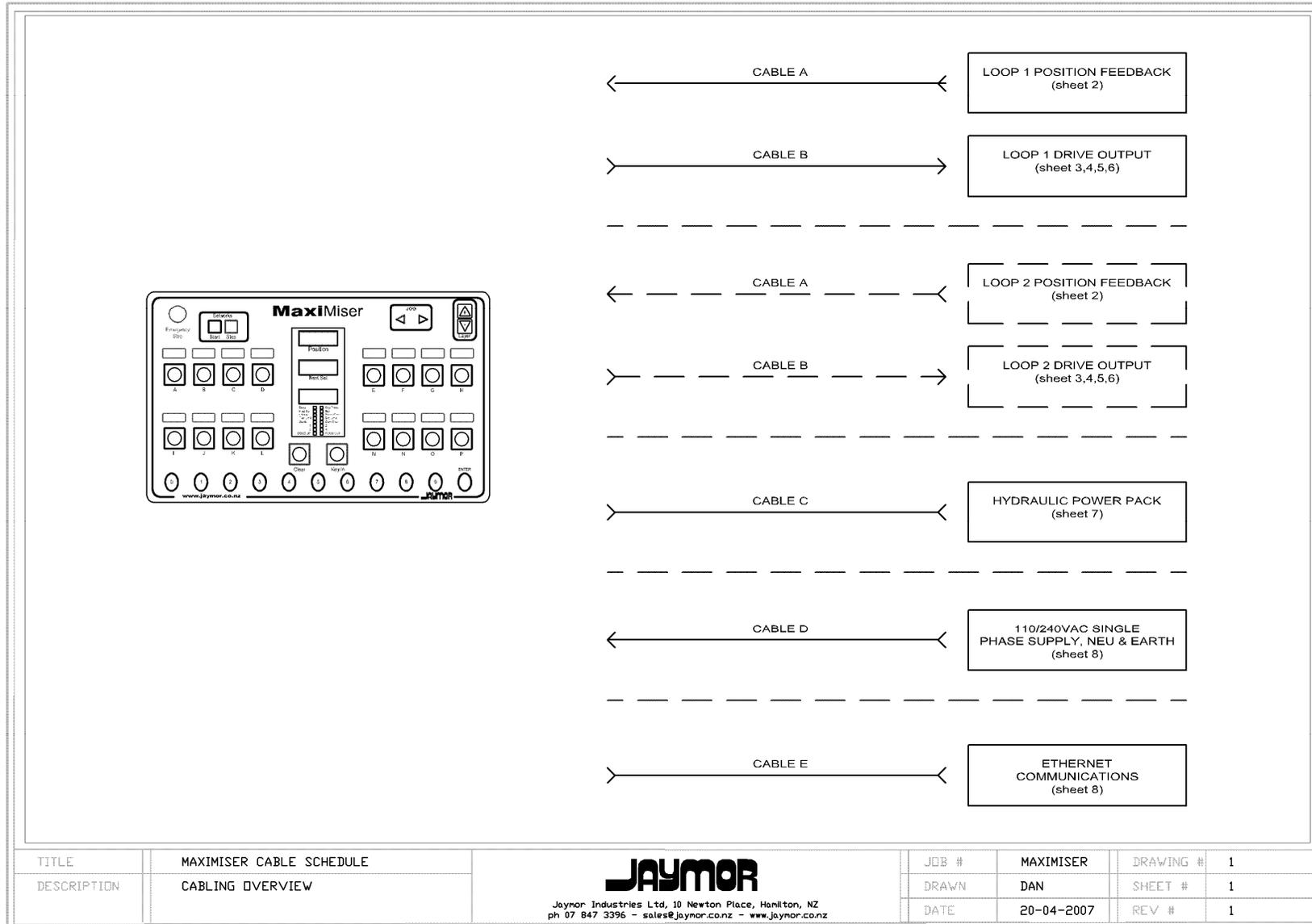
A full parameter list is included and a list of parameter values at the time of commissioning for the specific system.

These appendices are intended as a reference for Jaymor technicians, but may also be of some help to the operator in thoroughly understanding the system.

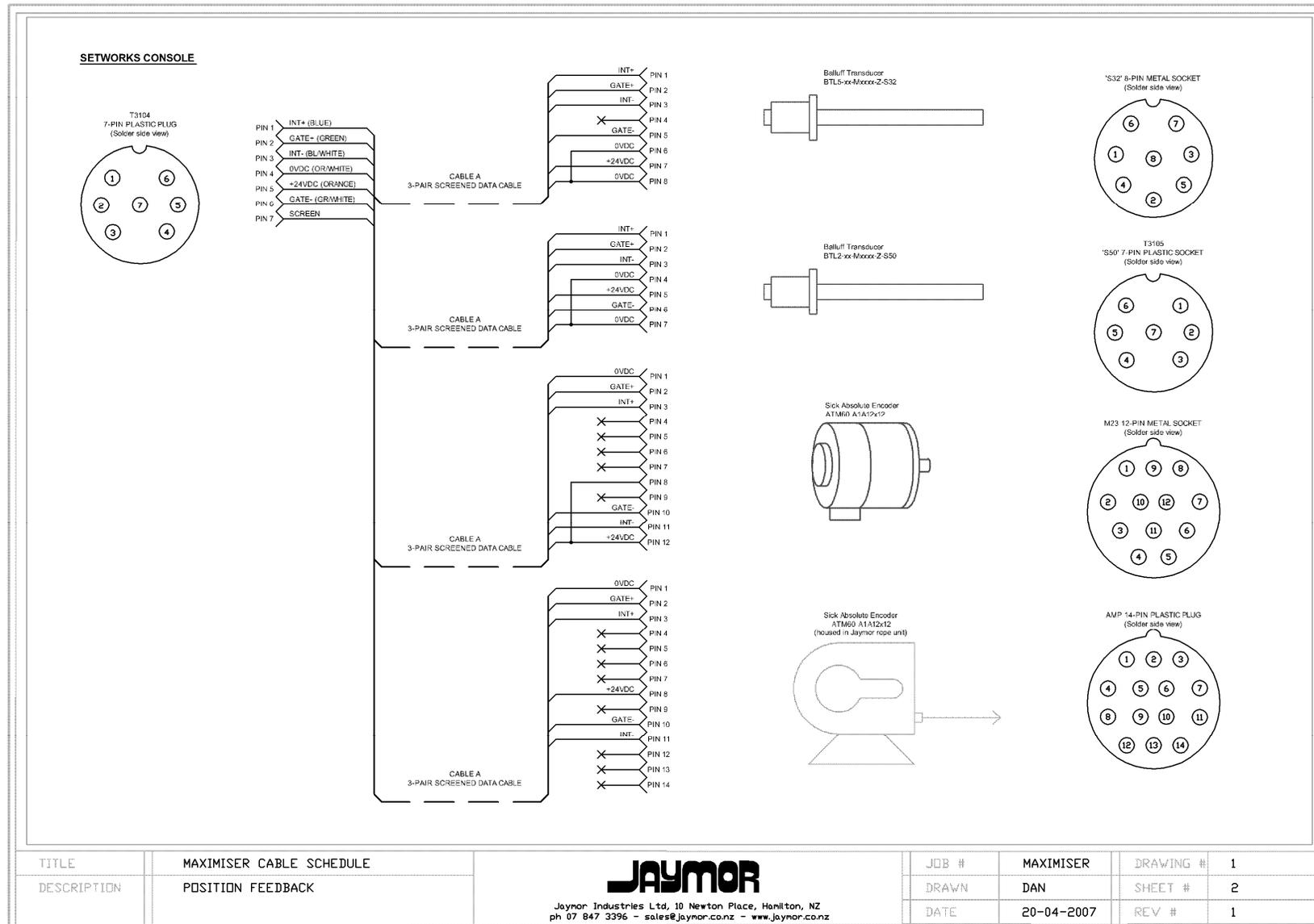


A. CABLE SCHEDULE

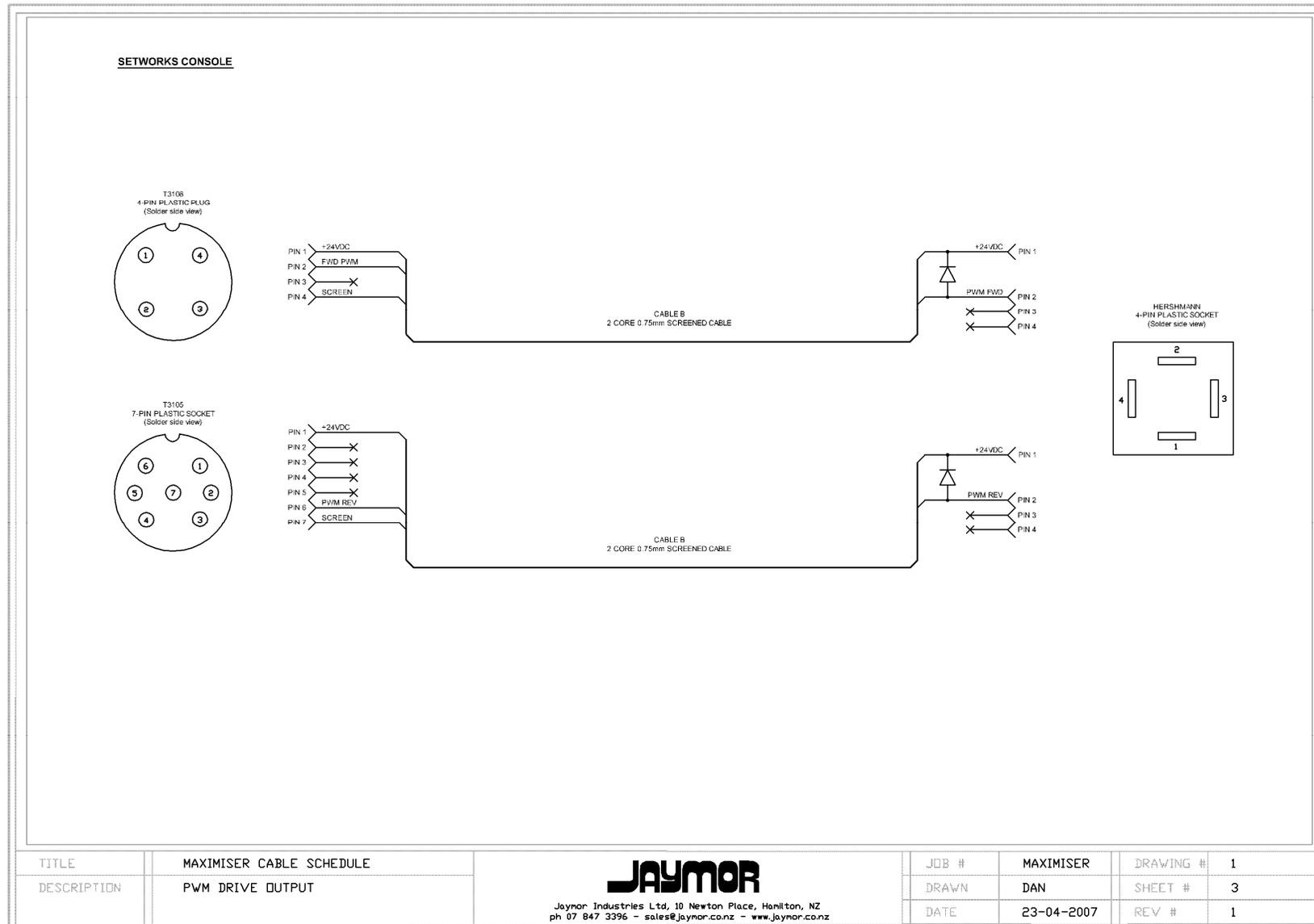
A.1 MAXIMISER CABLING OVERVIEW



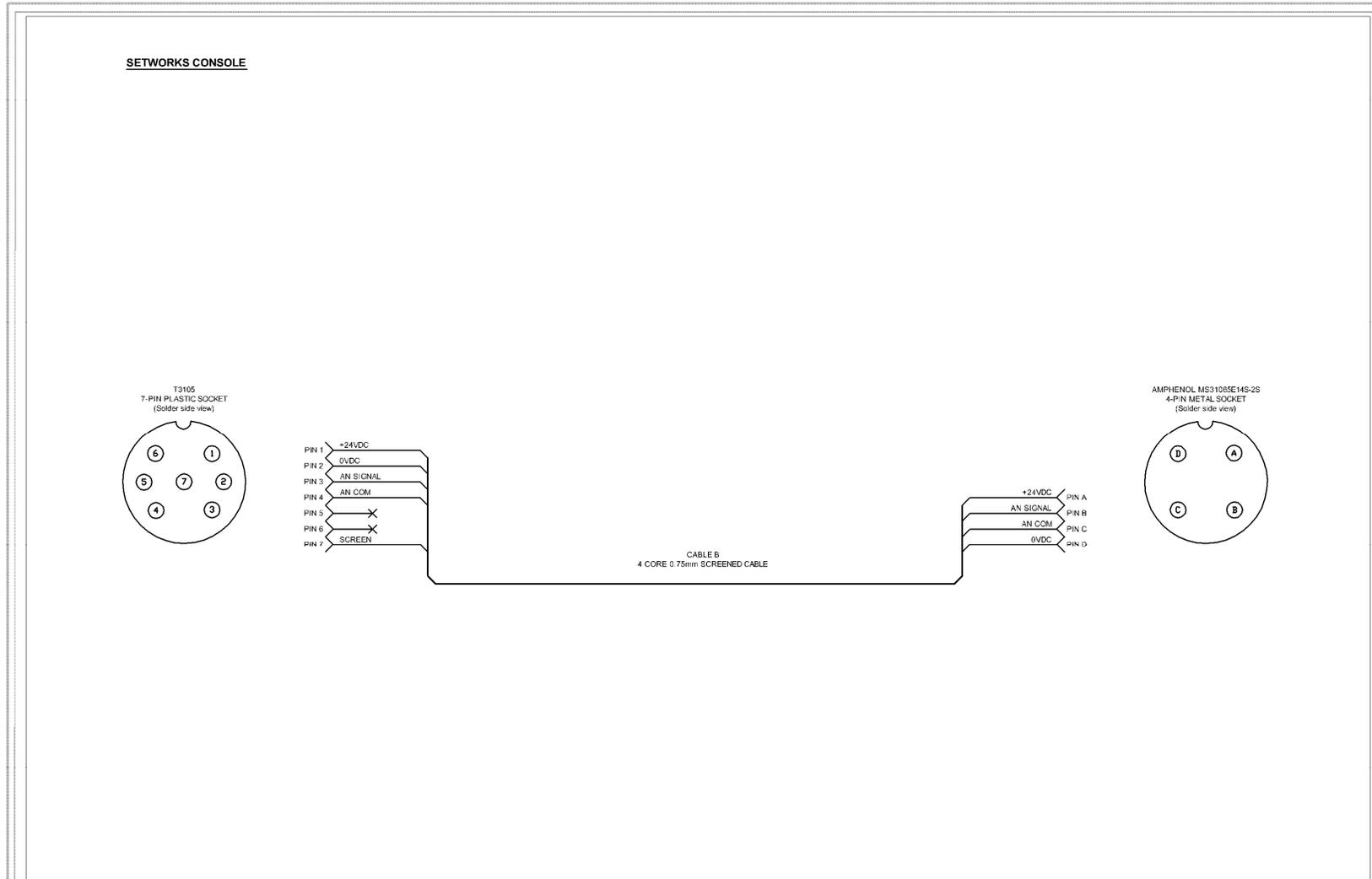
A.2 POSITION FEEDBACK WIRING



A.3 PWM DRIVE OUTPUT WIRING



A.4 TEXTRON SERVO VALVE WIRING



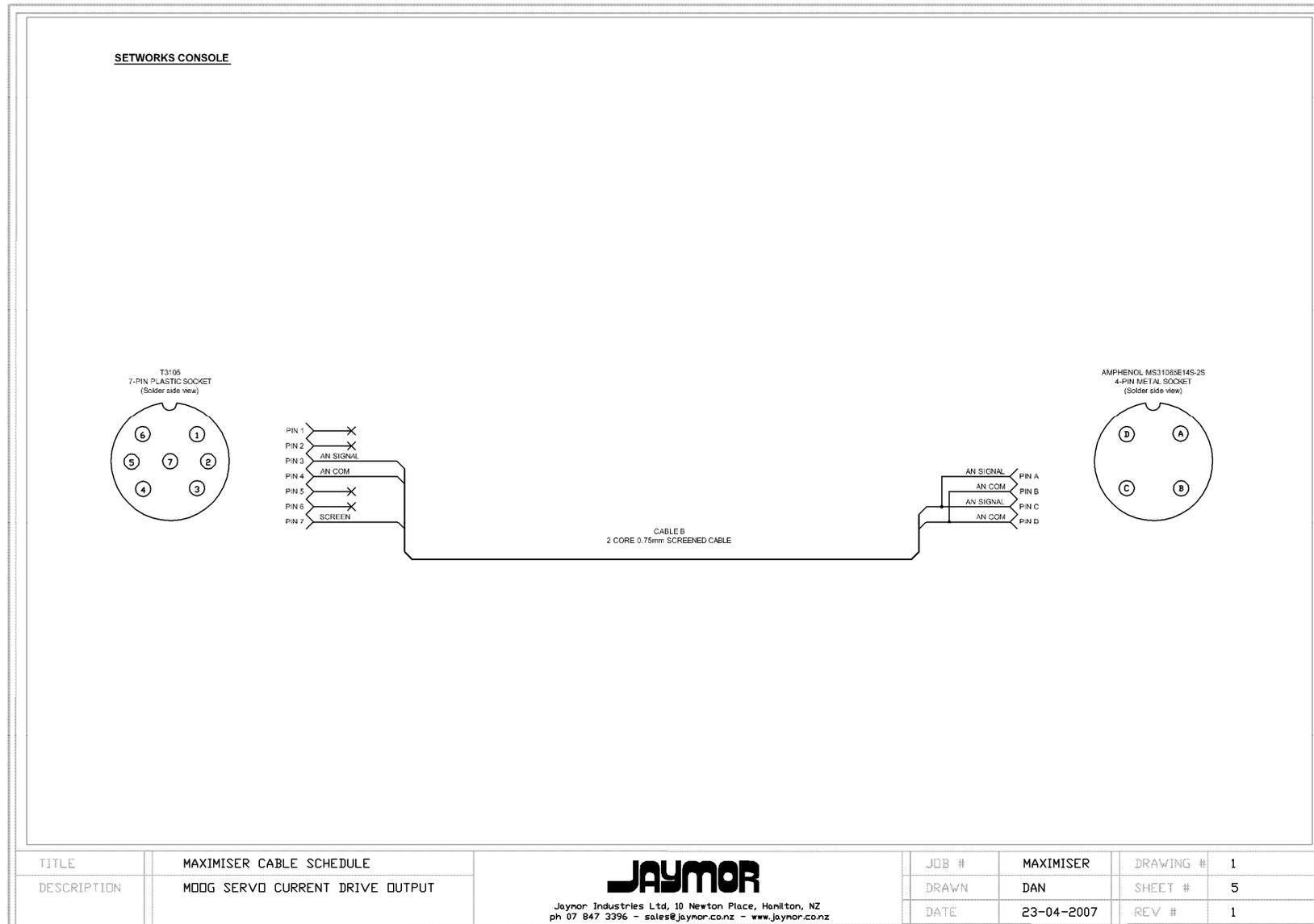
TITLE	MAXIMISER CABLE SCHEDULE
DESCRIPTION	TEXTRON SERVO DRIVE OUTPUT



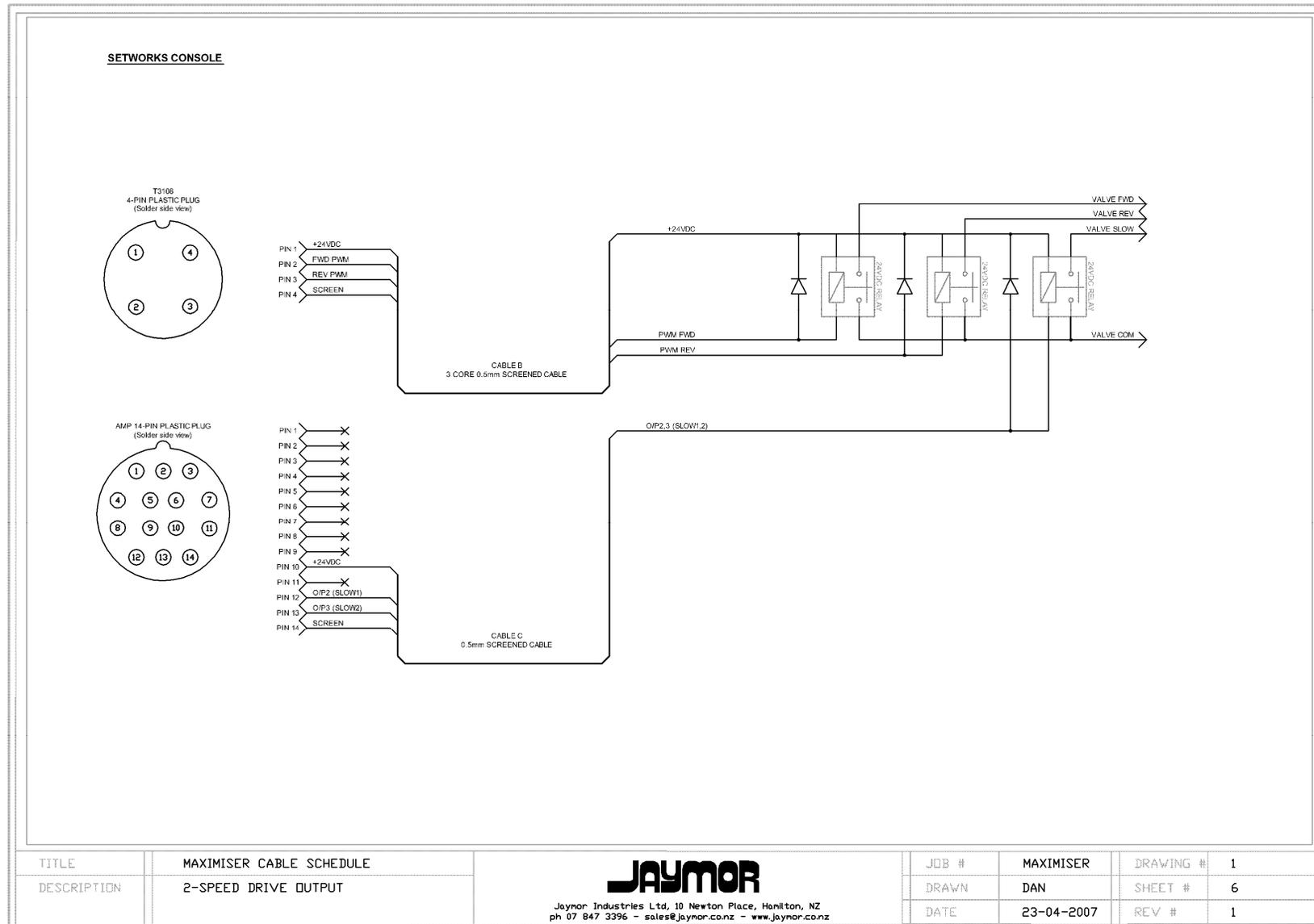
Jaymor Industries Ltd, 10 Newton Place, Hamilton, NZ
 ph 07 847 3396 - sales@jaymor.co.nz - www.jaymor.co.nz

JOB #	MAXIMISER	DRAWING #	1
DRAWN	DAN	SHEET #	4
DATE	23-04-2007	REV #	1

A.5 MOOG SERVO VALVE WIRING



A.6 TWO SPEED RELAY DRIVE SYSTEM WIRING



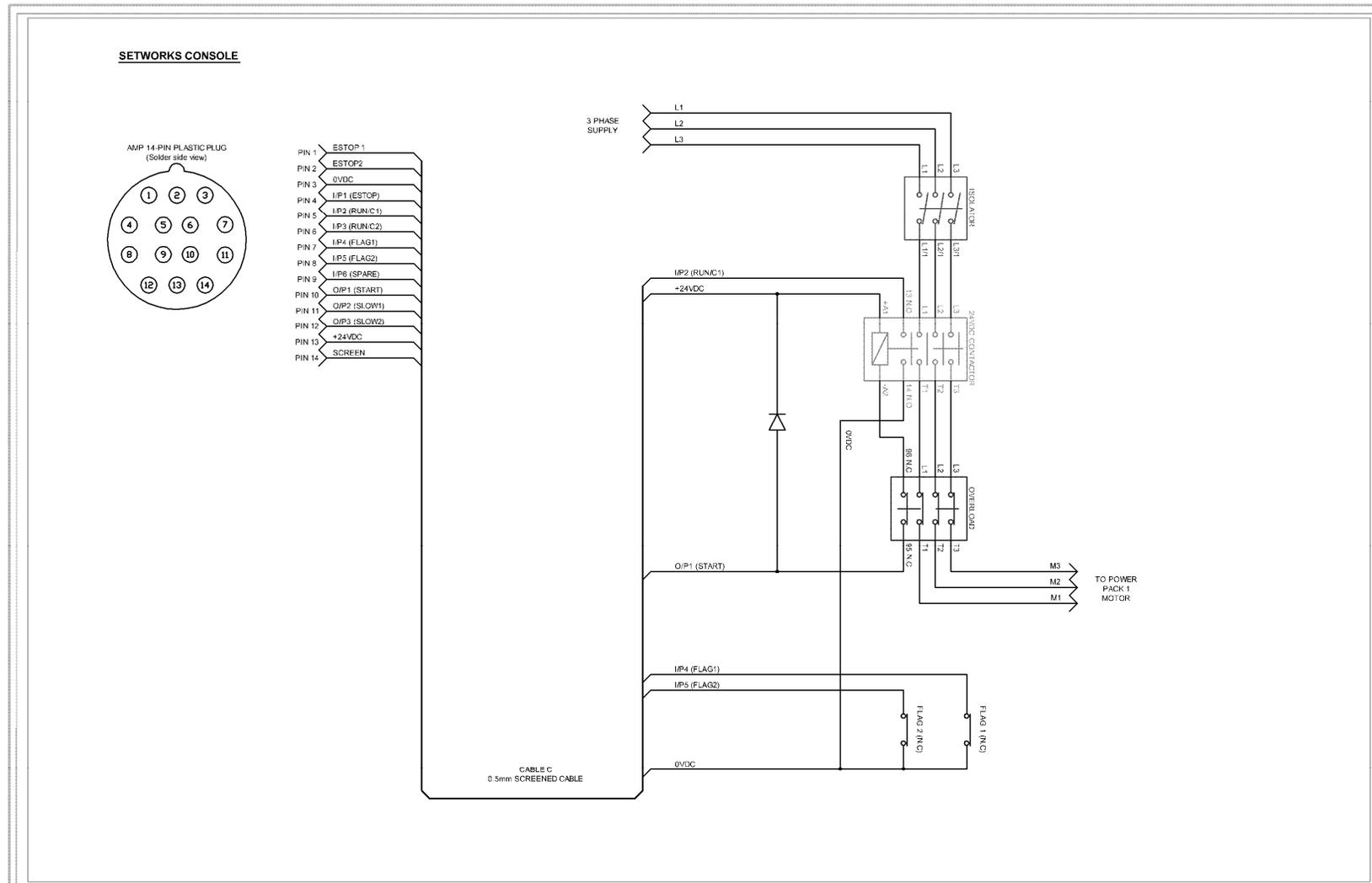
TITLE	MAXIMISER CABLE SCHEDULE
DESCRIPTION	2-SPEED DRIVE OUTPUT



Jaymor Industries Ltd, 10 Newton Place, Hamilton, NZ
 ph 07 847 3396 - sales@jaymor.co.nz - www.jaymor.co.nz

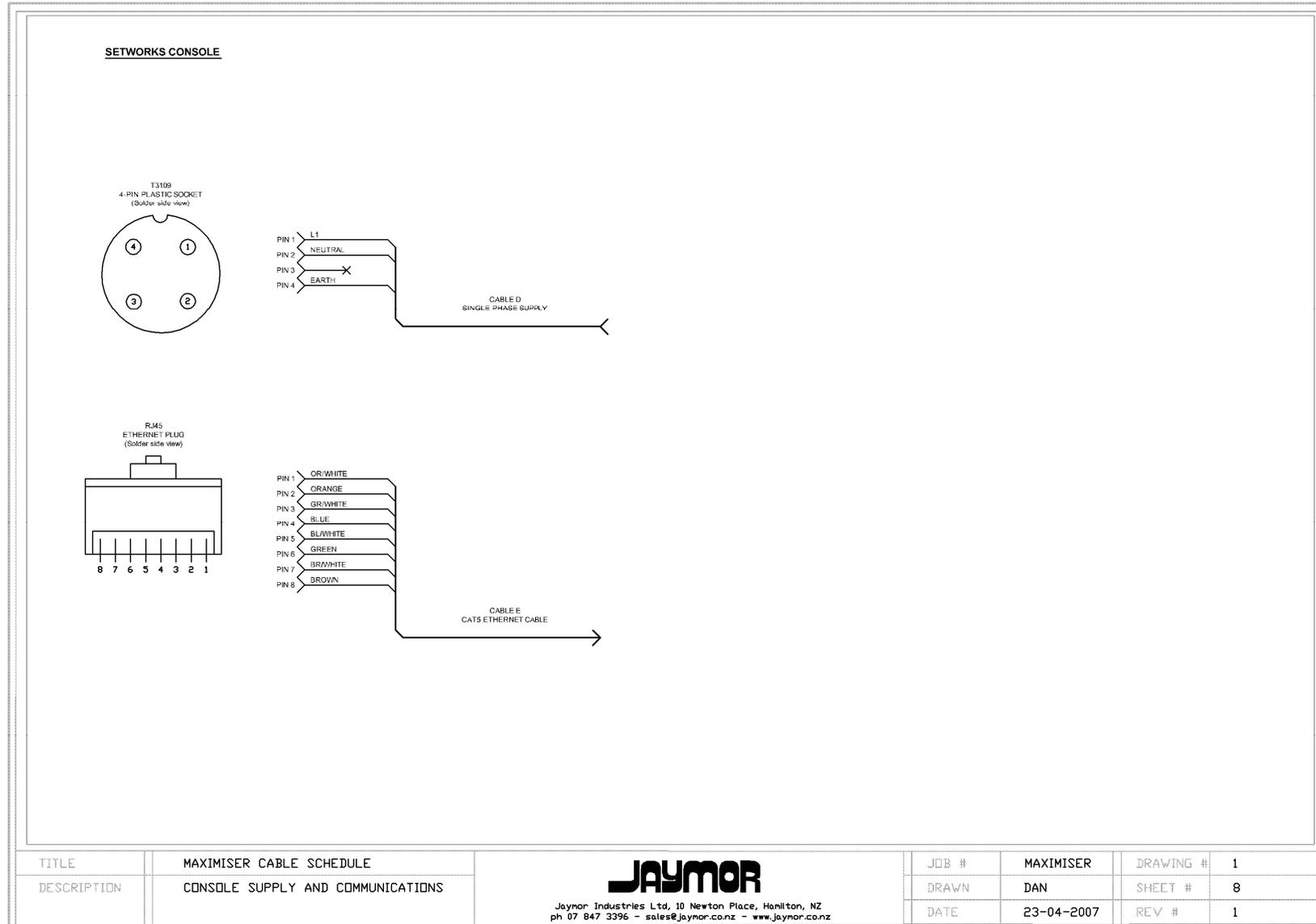
JOB #	MAXIMISER	DRAWING #	1
DRAWN	DAN	SHEET #	6
DATE	23-04-2007	REV #	1

A.7 HYDRAULIC POWER PACK WIRING



TITLE	MAXIMISER CABLE SCHEDULE	JAYMOR Jaymor Industries Ltd, 10 Newton Place, Hamilton, NZ ph 07 847 3396 - sales@jaymor.co.nz - www.jaymor.co.nz	JOB #	MAXIMISER	DRAWING #	1
DESCRIPTION	HYDRAULIC POWER PACK WIRING		DRAWN	DAN	SHEET #	7
			DATE	23-04-2007	REV #	1

A.8 SUPPLY AND COMMUNICATIONS WIRING



B. ELECTRICAL DRAWINGS

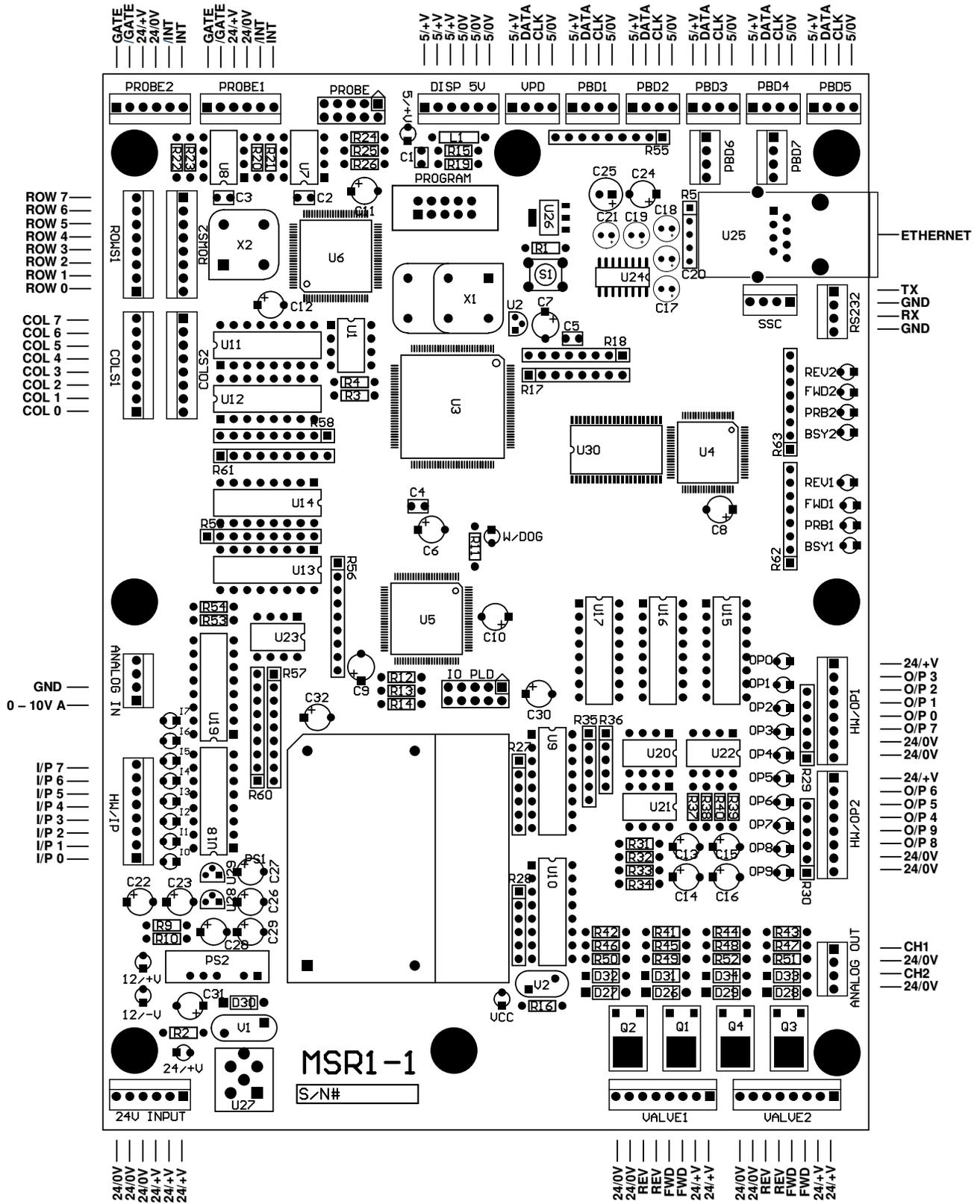
B.1 KEYBOARD MATRIX

	C1	C2	C3	C4	C5	C6	C7	C8
R1	0	1	2	3	4	5	6	7
R2	A	B	C	D	E	F	G	H
R3	I	J	K	L	M	N	O	P
R4	8	9	ENTER	CLEAR		RETRACT		
R5	LAYER UP							
R6	LAYER DOWN		START	STOP				
R7								
R8		KEYIN	JOG IN	JOG OUT				

Matrix Wiring Colours:

R1 / C1	WHITE
R2 / C2	RED
R3 / C3	ORANGE
R4 / C4	YELLOW
R5 / C5	GREY
R6 / C6	BLUE
R7 / C7	PURPLE
R8 / C8	BROWN

B.2 MSR1-1 CONTROL BOARD LAYOUT



B.3 DIAGNOSTIC LEDs

The diagnostic LEDs located to the right edge of the electronic controller board are used to indicate the conditions as labelled, i.e. Busy, Probe Error and Drive outputs Fwd and Rev.

The watchdog LED (**W/DOG**) indicates that the controller is running correctly and should flash rapidly at all times. If the LED is either continuously on or off the controller has locked up and will require resetting.

There is also an LED for every input / output on the controller board.

C. PARAMETER LIST

C.1 FRONT END PARAMETERS

No:	NAME:	DESCRIPTION:	UNITS:	RANGE:
CONSOLE PARAMETERS				
1	Display Rounding	0 = Display rounding off. 1 = Display rounding on. 2 = Imperial displays – rounded to 2 D.Ps.	1	0 – 2
2	PIN Required	0 = PIN is always required to enter parameter mode. 1 = PIN is only required once after boot up to access parameter mode.	1	0 – 1
3	Matrix Filter Counter	Controls the amount of filtering applied to the pushbutton matrix.	0.1s	0.0 – 10.0
4	Jog Button Invert	Swaps the function of the Jog buttons on the setworks console: 0 = Normal jog buttons. 1 = Jog buttons inverted.	1	0 – 1
5	Setworks Type Select	0 = Miser single/dual axis system. 1 = Carriage / Slabber system. 2 = Tachikawa Mill 1 Edger. 3 = Tachikawa Mill 2 Edger. 4 = Mahoe Twin Axis.	1	0 - 4
6	UDP Network Address	0 = Master on network, or no network enabled. 1 – 199 = Slave address on network	1	0 - 199
7				
8				
9				
SET PARAMETERS				
10	Set Mode	0 = Instant set; no stacking of sizes. 1 = Flag set; flag used to move through the set.	1	0 – 1
11	Clear Operation	0 = Standard Operation (entire stack is emptied when Clear is pressed). 1 = Retain Stack (only the entry at the top of the stack is erased).	1	0 - 1
12	Program size precision	0 = Sizes are saved to nearest whole mm. 1 = Sizes are saved to nearest 0.1 mm.	1	0 - 1
13	Auto-calibrate Inhibit	0 = Auto-calibrate inhibited. 1 = Auto-calibrate allowed.	1	0 – 1
14	Crash Tolerance	Crash or racking tolerance in a multi-axis system.	0.1mm	0.0 – 2000.0
15	Quick Jump Layers	0 = Standard layer selection. 1 = Quick Jump layers (hold 'Mode' and press 'A' to 'H' to select layers.	1	0 - 1
16				
17				
18				
19				

DISPLAY PARAMETERS																																																								
20	VPD 1 Format Select	<p>Specifies the data to be displayed in the Loop 1 Vertical Position Display:</p> <table border="1"> <thead> <tr> <th>POS</th> <th>NEXT SET</th> <th>LAYER</th> <th>STATUS</th> </tr> </thead> <tbody> <tr> <td>0 = L1 pos;</td> <td>L1 Next Set;</td> <td>Layer;</td> <td>L1, L2.</td> </tr> <tr> <td>1 = L1 pos;</td> <td>L1 Next Set;</td> <td>L2 pos;</td> <td>L1, L2.</td> </tr> <tr> <td>2 = L1 pos;</td> <td>L1 Next Set;</td> <td>L3 pos;</td> <td>L1, L3.</td> </tr> <tr> <td>3 = L1 pos;</td> <td>L1 Next Set;</td> <td>L4 pos;</td> <td>L1, L3, L4.</td> </tr> <tr> <td>4 = L1 pos;</td> <td>L1 Next Set;</td> <td>Pick State;</td> <td>L1, L3, L4.</td> </tr> <tr> <td>5 = L1 pos;</td> <td>L1 Next Set;</td> <td>L1 counts;</td> <td>L1, L2.</td> </tr> <tr> <td>6 = L1 pos;</td> <td>L1 Next Set;</td> <td>L2 counts;</td> <td>L1, L2.</td> </tr> <tr> <td>7 = L1 pos;</td> <td>L1 Next Set;</td> <td>L1 drive;</td> <td>L1, L2.</td> </tr> <tr> <td>8 = L1 pos;</td> <td>L1 Next Set;</td> <td>L2 drive;</td> <td>L1, L2.</td> </tr> <tr> <td>9 = L1 pos;</td> <td>L1 Next Set;</td> <td>L1 An I/P;</td> <td>L1, L2.</td> </tr> <tr> <td>10 = VPD1-0</td> <td colspan="2">10 bar LED status display</td> <td></td> </tr> <tr> <td>11 = Matrix diagnosis</td> <td colspan="3">displayed in VPD1 Layer.</td> </tr> </tbody> </table>	POS	NEXT SET	LAYER	STATUS	0 = L1 pos;	L1 Next Set;	Layer;	L1, L2.	1 = L1 pos;	L1 Next Set;	L2 pos;	L1, L2.	2 = L1 pos;	L1 Next Set;	L3 pos;	L1, L3.	3 = L1 pos;	L1 Next Set;	L4 pos;	L1, L3, L4.	4 = L1 pos;	L1 Next Set;	Pick State;	L1, L3, L4.	5 = L1 pos;	L1 Next Set;	L1 counts;	L1, L2.	6 = L1 pos;	L1 Next Set;	L2 counts;	L1, L2.	7 = L1 pos;	L1 Next Set;	L1 drive;	L1, L2.	8 = L1 pos;	L1 Next Set;	L2 drive;	L1, L2.	9 = L1 pos;	L1 Next Set;	L1 An I/P;	L1, L2.	10 = VPD1-0	10 bar LED status display			11 = Matrix diagnosis	displayed in VPD1 Layer.			1	1 - 11
POS	NEXT SET	LAYER	STATUS																																																					
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10 = VPD1-0	10 bar LED status display																																																							
11 = Matrix diagnosis	displayed in VPD1 Layer.																																																							
21	VPD 2 Format Select	<p>Specifies the data to be displayed in the Loop 2 Vertical Position Display:</p> <table border="1"> <thead> <tr> <th>POS</th> <th>NEXT SET</th> <th>LAYER</th> <th>STATUS</th> </tr> </thead> <tbody> <tr> <td>0 = L2 pos;</td> <td>----</td> <td>----</td> <td>----</td> </tr> <tr> <td>1 = L2 pos;</td> <td>L2 Next Set;</td> <td>----</td> <td>L2.</td> </tr> <tr> <td>2 = L2 pos;</td> <td>L2 Next Set;</td> <td>L3 pos;</td> <td>L2.</td> </tr> <tr> <td>3 = L2 pos;</td> <td>L2 Next Set;</td> <td>L4 pos;</td> <td>L2.</td> </tr> <tr> <td>4 = L2 pos;</td> <td>L2 Next Set;</td> <td>Pick State;</td> <td>L2.</td> </tr> <tr> <td>5 = VPD1-0</td> <td colspan="2">10 bar LED status display</td> <td></td> </tr> </tbody> </table>	POS	NEXT SET	LAYER	STATUS	0 = L2 pos;	----	----	----	1 = L2 pos;	L2 Next Set;	----	L2.	2 = L2 pos;	L2 Next Set;	L3 pos;	L2.	3 = L2 pos;	L2 Next Set;	L4 pos;	L2.	4 = L2 pos;	L2 Next Set;	Pick State;	L2.	5 = VPD1-0	10 bar LED status display			1	1 - 5																								
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4 = L2 pos;	L2 Next Set;	Pick State;	L2.																																																					
5 = VPD1-0	10 bar LED status display																																																							
22	PBD Format Select	<p>Specifies the format of the data to be displayed in the consoles pushbutton displays:</p> <p>0 = Standard button layout 1 = Standard button layout, saw numbers shown 2 = Button layout 2 3 = Button layout 2, saw numbers shown</p>	1	0 - 3																																																				
23	VPD Brilliance Level	Sets the brilliance level of the main displays on the networks console.	1	1 - 7																																																				
24	PBD Dim Brilliance Level	Sets the brilliance level of the pushbutton displays when they are in "dim" (default) mode.	1	1 - 7																																																				
25	PBD Bright Brilliance Level	Sets the brilliance level of the pushbutton displays when they are in "bright" mode.	1	1 - 7																																																				
26	Forwardset Counter Control	<p>0 = F/S counter disabled 1 = F/S counter enabled</p>	1	0 - 1																																																				
27	Edger Absolute Positions	<p>Sets the format that the positions of the saws in an edger system will take:</p> <p>0 = Display saw absolute positions. 1 = Display the gaps between the saws</p>	1	0 - 1																																																				
28																																																								
29																																																								

HW I/O PARAMETERS				
30	Hardwired Filter Delay	The time delay used to filter the hardwired inputs to the system to avoid the possibility of switch bounce problems.	0.1s	0.0 – 10.0
31	Run Confirm Operation 1	0 = Run confirm input bypassed. 1 = Run confirm input used.	1	0 – 1
32	Flag 1 Operation	0 = Flag input bypassed. 1 = Normal flag operation – interrupted set resumes when flag clears. 2 = Current set is cancelled when flag is opened.	1	0 – 2
33	Flag 2 Operation	0 = Flag input bypassed. 1 = Normal flag operation – interrupted set resumes when flag clears. 2 = Current set is cancelled when flag is opened. 3 = Use “Flag 1” as the input for “Flag 2”.	1	0 - 3
34	Jog Back Flag Override	0 = “Jog Back” overrides the flag input. 1 = “Jog Back” is stopped when the flag opens.	1	0 – 1
35	Pullback Operation	0 = Pullback disabled. 1 = Manual pullback. 2 = Auto pullback. 3 = Preselect auto pullback.	1	0 - 3
36	Pullback Delay	Time delay after the dogs are lowered before the auto-pullback is engaged.	0.1s	0.0 – 10.0
37	Slow Valve Delay	The time delay between the “Fast” and “Slow” valves closing on a two-speed system	0.1s	0.0 – 10.0
38	Run Confirm Operation 2	0 = Run confirm input bypassed. 1 = Run confirm input used. 2 = Run confirm 1 input used for Run confirm 2	1	0 – 2
39				

HW INPUT SELECTION PARAMETERS				
40	HW IP0 Selection	Specifies the function that HW IP0 will perform: 0 = IP is not used. 1 = Estop. 2 = Run Confirm 1. 3 = Loop1 Flag. 4 = Loop2 Flag. 5 = Prox Switch 1. 6 = Other Prox switches. 7 = Run Confirm 2. 8 = Estop2. 9 = Spare I/P 1. 10 = Spare I/P 2. 11 = Spare I/P 3. 12 = Spare I/P 4. 13 = Spare I/P 5. 14 = Spare I/P 6. 15 = Spare I/P 7. 16 = Spare I/P 8.	1	0 - 7
41	HW IP1 Selection	Specifies the function that HW IP1 will perform.	1	0 - 7
42	HW IP2 Selection	Specifies the function that HW IP2 will perform.	1	0 - 7
43	HW IP3 Selection	Specifies the function that HW IP3 will perform.	1	0 - 7
44	HW IP4 Selection	Specifies the function that HW IP4 will perform.	1	0 - 7
45	HW IP5 Selection	Specifies the function that HW IP5 will perform.	1	0 - 7
46	HW IP6 Selection	Specifies the function that HW IP6 will perform.	1	0 - 7
47	HW IP7 Selection	Specifies the function that HW IP7 will perform.	1	0 - 7
48	HW IP8 Selection	Specifies the function that HW IP8 will perform.	1	0 - 7
49	HW IP9 Selection	Specifies the function that HW IP9 will perform.	1	0 - 7
50	HW IP10 Selection	Specifies the function that HW IP10 will perform.	1	0 - 7
51	HW IP11 Selection	Specifies the function that HW IP11 will perform.	1	0 - 7
52	HW IP12 Selection	Specifies the function that HW IP12 will perform.	1	0 - 7
53	HW IP13 Selection	Specifies the function that HW IP13 will perform.	1	0 - 7
54	HW IP14 Selection	Specifies the function that HW IP14 will perform.	1	0 - 7
55	HW IP15 Selection	Specifies the function that HW IP15 will perform.	1	0 - 7
56				
57				
58				
59				

HW OUTPUT SELECTION PARAMETERS				
60	HW OP0 Selection	Specifies the function that HW OP0 will perform: 0 = OP is not used. 1 = Start. 2 = Dogs U/D. 3 = Dogs I/O. 4 = Half Dog. 5 = Tong Dog. 6 = Pullback. 7 = Flipper. 8 = Valve Lock1. 9 = Valve Lock2. 10 = Taper Left. 11 = Taper Right. 12 = Slow Valve1 / Unipolar Rev1. 13 = Slow Valve2 / Unipolar Rev2. 14 = Taper Isolate. 15 = Taper Cancel.	1	0 - 15
61	HW OP1 Selection	Specifies the function that HW OP1 will perform.	1	0 - 15
62	HW OP2 Selection	Specifies the function that HW OP2 will perform.	1	0 - 15
63	HW OP3 Selection	Specifies the function that HW OP3 will perform.	1	0 - 15
64	HW OP4 Selection	Specifies the function that HW OP4 will perform.	1	0 - 15
65	HW OP5 Selection	Specifies the function that HW OP5 will perform.	1	0 - 15
66	HW OP6 Selection	Specifies the function that HW OP6 will perform.	1	0 - 15
67	HW OP7 Selection	Specifies the function that HW OP7 will perform.	1	0 - 15
68	HW OP8 Selection	Specifies the function that HW OP8 will perform.	1	0 - 15
69	HW OP9 Selection	Specifies the function that HW OP9 will perform.	1	0 - 15
70	HW OP10 Selection	Specifies the function that HW OP10 will perform.	1	0 - 15
71	HW OP11 Selection	Specifies the function that HW OP11 will perform.	1	0 - 15
72	HW OP12 Selection	Specifies the function that HW OP12 will perform.	1	0 - 15
73	HW OP13 Selection	Specifies the function that HW OP13 will perform.	1	0 - 15
74	HW OP14 Selection	Specifies the function that HW OP14 will perform.	1	0 - 15
75	HW OP15 Selection	Specifies the function that HW OP15 will perform.	1	0 - 15
76				
77				
78				
79				

SLAVE CARD PARAMETERS				
80				
81				
82				
83				
84				
85				
86				
87				
88				
89				
DIAGNOSTIC PARAMETERS				
90	Maximum Loop Time	The maximum time the system has taken to perform a loop since this parameter was last read.	0.1ms	-
91	Running Time	The amount of time the system has been running since the master controller card was last reset.	1 min	-
92	Software Version	The version of software currently running in the master controller card.	0.01	-
93	Plot Sample Period	The length of time after a set is initiated that the system will record the data for the set plotting software.	1 sec	1 - 10
94	Serial Baud Rate	Sets the baud rate for serial communications: 1 = 9600 bps 2 = 14400 bps 3 = 19200 bps 4 = 28800 bps 5 = 38400 bps	1	1 - 5
95	Operator PIN Number	The PIN number used by the operator. This PIN allows access to the "Probe Offset" parameters only.	1	0 – 9999
96	Supervisor PIN Number	The PIN number used by the supervisor. This PIN allows access to all of the parameters for the system.	1	0 - 9999
97				
98				
99				

C.2 LOOP PARAMETERS

NOTE: When adjusting a parameter on the operator's console, the parameter number is **preceded by the loop number**, e.g Loop 1 parameter 2 = 102.

No:	NAME:	DESCRIPTION:	UNITS:	RANGE:
GENERAL LOOP SETTINGS				
*01	Kerf	Width of the saw cut.	0.1mm	0.0 – 100.0
*02	Loop Type	0 = Loop disabled. 1 = Open loop set; no position hold. 2 = Open loop set; PID position hold. 3 = Closed loop profile set; no position hold. 4 = Closed loop profile set; PID position hold.	1	0 – 4
*03	Park / Retract Distance	The target for the system when performing a "Park" or "Retract" operation	0.1mm	1.0 – 2000.0
*04	Offset Distance	The distance used on a carriage when performing an "Offset" operation	0.1mm	0.0 – 2000.0
*05	Set Type	1 = Normal mode (absolute set unless within "Minimum Set Distance" P*06) 2 = Always set forward 3 = Absolute setting in both directions 4 = Always set backwards	1	1 – 4
*06	Minimum Set Distance	When P*05 = 1, requested sets of a distance less than specified here will cause a backup and set forward to the target	0.1mm	0.0 – 100.0
*07	Backup Distance	Distance to backup when P*05 = 1 or 2	0.1mm	0.0 – 100.0
*08				
*09				
LIMIT PARAMETERS				
*10	Limit Type	1 = No limits 2 = Manual limits	1	1 – 2
*11	Back Limit	The maximum distance from the saw that the system can safely travel to	0.1mm	1.0 – 2000.0
*12	Forward Limit / Dogs In Limit	This is the forward limit of a resaw / breastbench setworks. It is also the "Dogs In" limit for a carriage setworks	0.1mm	0.0 – 2000.0
*13	Dogs Out Limit	This is the "Dogs Out" limit for a carriage setworks	0.1mm	0.0 – 2000.0
*14	Flipper Limit	This is the "Flipper Extended" limit for a carriage setworks	0.1mm	0.0 – 2000.0
*15	Half Dog Limit	This is the "Half Dogs" limit for a carriage setworks	0.1mm	0.0 – 2000.0
*16	Taper Limit	This is the "Taper" limit for a carriage setworks	0.1mm	0.0 – 2000.0
*17	Tong Dog Limit	This is the "Tong Dog" limit for a carriage setworks	0.1mm	0.0 – 2000.0
*18				
*19				

PROBE PARAMETERS				
*20	Probe Type	0 = Simulate mode 1 = "P-Type" probe 2 = "L-Type" probe 3 = Stegmann encoder	1	0 – 3
*21	Probe Invert	0 = Normal probe (extended = small position) 1 = Inverted probe (extended = large position)	1	0 – 1
*22	Probe Offset	The distance to the saw at maximum extension	0.1mm	0.0 – 2000.0
*23	Probe Stroke	The distance covered by the probe / encoder when travelling between "Probe Max Counts" and "Probe Min Counts"	0.1mm	0.0 – 2000.0
*24	Probe Max Counts	The maximum number of counts the probe / encoder will receive when in operation	1	100 - 50000
*25	Probe Min Counts	The minimum number of counts the probe / encoder will receive when in operation	1	100 - 50000
*26	Loop Negative Offset	Used when Loop is able to travel through the saw line, and as such go to a negative position.	0.1mm	0.0 – 2000.0
*27				
*28				
*29				
GENERAL DRIVE PARAMETERS				
*30	Output Drive Select	1 = Relay 2 = PWM 3 = Bipolar Analog (-10V to +10V) 4 = Unipolar Analog (0V to +10V)	1	1 - 4
*31	Drive Output Invert	0 = Normal drive output 1 = Inverted drive output	1	0 – 1
*32	Valve Dither	Amount of physical dither added to the output drive signal	0.1%	0.0 – 100.0
*33	Ramp Up Boost	Extra % added to drive output when accelerating. Only used if P*02 = 1 or 2.	0.1%	0.0 – 100.0
*34	Ramp Down Boost	Extra % added to drive output when decelerating. Only used if P*02 = 1 or 2.	0.1%	0.0 – 100.0
*35	Jog Limit Ramp	Ramp down deceleration used when jogging toward a limit	0.1m/s/s	0.1 – 10.0
*36	Taper Left Scale Factor	Percentage used to scale the speed of the axis when implemented as a middle knee of a carriage. This value is inverted for Taper Right operations.	0.1%	0.1 – 100.0
*37				
*38				
*39				

FORWARD DRIVE PARAMETERS				
*40	Forward Drift	In "Open Loop" this will set the drift distance for the system when setting forward. In "Closed Loop" this will define the PID position hold region	0.1mm	0.0 – 100.0
*41	Forward Deadband	Forward deadband % drive of the system	0.1%	0.0 – 100.0
*42	Forward Null	Constant bias added to the forward drive output when in "Open Loop Position Hold" (this parameter should be set to zero if P52 is set)	0.1%	0.0 – 100.0
*43	Maximum Forward Drive	Limits the forward drive output	0.1%	0.0 – 100.0
*44	Forward Ramp Up	Acceleration rate when setting or jogging forward	0.1m/s/s	0.1 – 10.0
*45	Forward Maximum Speed	Target forward speed when setting	0.05m/s	0.05 – 5.00
*46	Forward Ramp Down	Deceleration rate when setting forward	0.1m/s/s	0.1 – 10.0
*47	Jog Forward Ramp Down	Deceleration rate when jogging forward	0.1m/s/s	0.1 – 10.0
*48	Jog Forward Maximum Speed	Target forward speed when jogging	0.05m/s	0.05 – 5.00
*49	Jog Forward Slow Speed	Target speed when performing a "Slow" jog forward operation	0.05m/s	0.05 – 5.00
BACK DRIVE PARAMETERS				
*50	Back Drift	In "Open Loop" this will set the drift distance for the system when setting back. In "Closed Loop" this will define the PID position hold region	0.1mm	0.0 – 100.0
*51	Back Deadband	Back deadband % drive of the system	0.1%	0.0 – 100.0
*52	Back Null	Constant bias added to the back drive output when in "Open Loop Position Hold" (this parameter should be set to zero if P42 is set)	0.1%	0.0 – 100.0
*53	Maximum Back Drive	Limits the back drive output	0.1%	0.0 – 100.0
*54	Back Ramp Up	Acceleration rate when setting or jogging back	0.1m/s/s	0.1 – 10.0
*55	Back Maximum Speed	Target back speed when setting	0.05m/s	0.05 – 5.00
*56	Back Ramp Down	Deceleration rate when setting back	0.1m/s/s	0.1 – 10.0
*57	Jog Back Ramp Down	Deceleration rate when jogging back	0.1m/s/s	0.1 – 10.0
*58	Jog Back Maximum Speed	Target back speed when jogging	0.05m/s	0.05 – 5.00
*59	Jog Back Slow Speed	Target speed when performing a "Slow" jog back operation	0.05m/s	0.05 – 5.00

SETTING GAIN PARAMETERS				
*60	Kp (setting)	The proportional gain factor used when setting forward		0 - 1000
*61	Kp Limit (setting)	Limits the amount that the proportional gain factor (P*60) can become in the PID calculations		0 - 1000
*62	Ki (setting)	The integral gain factor used when setting fwd		0 - 1000
*63	Ki Limit (setting)	Limits the amount that the integral gain factor (P*62) can become in the PID calculations		0 - 1000
*64	F.F Ramp Up Forward	Feed-forward factor used when ramping up in the forward direction		0 – 1000
*65	F.F Ramp Up Backward	Feed-forward factor used when ramping up in the back direction		0 – 1000
*66	F.F Max Speed Forward	Feed-forward factor used when travelling at maximum speed in the forward direction		0 - 1000
*67	F.F Max Speed Back	Feed-forward factor used when travelling at maximum speed in the backward direction		0 – 1000
*68	F.F Ramp Down Forward	Feed-forward factor used when ramping down in the forward direction		0 – 1000
*69	F.F Ramp Down Backward	Feed-forward factor used when ramping down in the backward direction		0 - 1000
POSITION HOLD GAIN PARAMETERS (ONLY USED IF P*02 = 2 OR 4)				
*70	Kp (position hold)	The proportional gain factor used when holding position about a target in “Closed Loop”		0 – 1000
*71	Kp Limit (position hold)	Limits the amount that the proportional gain factor (P*70) can become in the PID calculations		0 - 1000
*72	Ki (position hold)	The integral gain factor used when holding position about a target in “Closed Loop”		0 – 1000
*73	Ki Limit (position hold)	Limits the amount that the integral gain factor (P*72) can become in the PID calculations		0 – 1000
*74				
*75				
*76				
*77				
*78				
*79				

*80	Plot Sample Period	The length of time after a set is initiated that the system will record the data for the set plotting software.	1 sec	1 - 10
*81	Plot Curve 1 Data	Specifies the data to be recorded for curve 1 in the set plot: 0 = curve disabled (no data recorded) 1 = loop current position 2 = loop target position 3 = loop current speed 4 = loop target speed 5 = loop current drive output % 6 = motion control word 7 = system control word 8 = output control word 1 9 = output control word 2 10 = loop requested position 11 = loop final target position 12 = loop status word 13 = input status word 14 = output status word 1 15 = output status word 2 16 = communications error counter 17 = loop probe counts 18 = probe error type 19 = <i>spare</i> 20 = <i>spare</i>	1	1 - 20
*82	Plot Curve 2 Data	Specifies the data to be recorded for curve 2 in the set plot.	1	1 - 20
*83	Plot Curve 3 Data	Specifies the data to be recorded for curve 3 in the set plot.	1	1 - 20
*84	Plot Curve 4 Data	Specifies the data to be recorded for curve 4 in the set plot.	1	1 - 20
*85	Plot Curve 5 Data	Specifies the data to be recorded for curve 5 in the set plot.	1	1 - 20
*86				
*87				
*88				
*89				

DIAGNOSTIC PARAMETERS				
*90				
*91				
*92	Software Version	Displays the version number of the software running in the loop controller.	0.01	-
*93				
*94				
*95				
*96				
*97	Probe Error Type	Explains the reason for the probe error: 0 = No probe error present for this axis 1 = No probe / encoder present 2 = Too many magnets detected 3 = No magnet detected on the probe 4 = Encoder Error 5 = Counts received exceed maximum 6 = Counts received less than minimum	1	0 – 5
*98	Probe Scale	The calculated scale used by the loop control to convert from counts to mm	0.01	-
*99	Raw Probe Counts	The current reading from the probe / encoder in counts.	1	-

C.4 FUNCTION MODE OPERATION

KEY	FUNCTION DESCRIPTION
A	Auto-Calibrate
B	<i>Not implemented</i>
C	<i>Not implemented</i>
D	<i>Not implemented</i>
E	<i>Not implemented</i>
F	<i>Not implemented</i>
G	<i>Not implemented</i>
H	<i>Not implemented</i>

Warm Up Modes:

Axis 1 Warm Up = "KeyIn" & "9"

Axis 2 Warm Up = "KeyIn" & "8"

Both Axis Warm Up = "KeyIn" & "7"

D. COMMISSIONING PARAMETERS

D.1 FRONT END PARAMETERS

No	Name	Value
0		
1	Display Rounding	
2	PIN Required	
3	Matrix Filter Counter	
4	Jog Button Invert	
5	Setworks Type Select	
6	UDP Network Address	
7		
8		
9		
10	Set Mode	
11	Clear Operation	
12	Program Size Precision	
13	Auto-calibrate Inhibit	
14	Crash Tolerance	
15	Quick Jump Layers	
16		
17		
18		
19		
20	VPD 1 Format Select	
21	VPD 2 Format Select	
22	PBD Format Select	
23	VPD Brilliance Level	
24	PBD Dim Brilliance Level	
25	PBD Bright Brilliance Level	
26	Forwardset Counter Control	
27	Edger Absolute Positions	
28		
29		
30	Hardwired Filter Delay	
31	Run Confirm Operation 1	
32	Flag 1 Operation	
33	Flag 2 Operation	
34	Jog Back Flag Override	
35	Pullback Operation	
36	Pullback Delay	
37	Slow Valve Delay	
38	Run Confirm Operation 2	
39		
40	HW IP0 Selection	
41	HW IP1 Selection	
42	HW IP2 Selection	
43	HW IP3 Selection	
44	HW IP4 Selection	
45	HW IP5 Selection	
46	HW IP6 Selection	
47	HW IP7 Selection	
48	HW IP8 Selection	
49	HW IP9 Selection	

No	Name	Value
50	HW IP10 Selection	
51	HW IP11 Selection	
52	HW IP12 Selection	
53	HW IP13 Selection	
54	HW IP14 Selection	
55	HW IP15 Selection	
56		
57		
58		
59		
60	HW OP0 Selection	
61	HW OP1 Selection	
62	HW OP2 Selection	
63	HW OP3 Selection	
64	HW OP4 Selection	
65	HW OP5 Selection	
66	HW OP6 Selection	
67	HW OP7 Selection	
68	HW OP8 Selection	
69	HW OP9 Selection	
70	HW OP10 Selection	
71	HW OP11 Selection	
72	HW OP12 Selection	
73	HW OP13 Selection	
74	HW OP14 Selection	
75	HW OP15 Selection	
76		
77		
78		
79		
80	Card Type	
81	Card Address	
82	Slave 1 Address	
83	Slave 2 Address	
84	Slave 3 Address	
85	Slave 4 Address	
86	Slave 5 Address	
87	Slave 6 Address	
88	Slave 7 Address	
89	Slave 8 Address	
90	Maximum Loop Time	
91	Running Time	
92	Software Version	
93	Plot Sample Period	
94	Serial Baud Rate	
95	Operator PIN Number	
96	Supervisor PIN Number	
97		
98		
99		

D.2 LOOP 1 POSITION CONTROL PARAMETERS

No	Name	Value
100		
101	Kerf	
102	Loop Type	
103	Park / Retract Distance	
104	Offset Distance	
105	Set Type	
106	Minimum Set Distance	
107	Backup Distance	
108		
109		
110	Limit Type	
111	Back Limit	
112	Forward Limit (Dogs In)	
113	Dogs Out Limit	
114	Flipper Limit	
115	Half Dog Limit	
116	Taper Limit	
117	Tong Dog Limit	
118		
119		
120	Probe Type	
121	Probe Invert	
122	Probe Offset	
123	Probe Stroke	
124	Probe Max Counts	
125	Probe Min Counts	
126	Loop Negative Offset	
127		
128		
129		
130	Output Drive Select	
131	Drive Output Invert	
132	Valve Dither	
133	Ramp Up Boost	
134	Ramp Down Boost	
135	Jog Limit Ramp	
136	Taper Left Scale Factor	
137		
138		
139		
140	Forward Drift	
141	Forward Deadband	
142	Forward Null	
143	Maximum Fwd Drive	
144	Forward Ramp Up	
145	Fwd Maximum Speed	
146	Forward Ramp Down	
147	Jog Fwd Ramp Down	
148	Jog Fwd Max Speed	
149	Jog Fwd Slow Speed	

No	Name	Value
150	Back Drift	
151	Back Deadband	
152	Back Null	
153	Maximum Back Drive	
154	Back Ramp Up	
155	Back Max Speed	
156	Back Ramp Down	
157	Jog Back Ramp Dwn	
158	Jog Back Max Speed	
159	Jog Back Slow Speed	
160	Kp setting	
161	Kp limit	
162	Ki setting	
163	Ki limit	
164	F.F ramp up fwd	
165	F.F ramp up back	
166	F.F max speed fwd	
167	F.F max speed back	
168	F.F ramp down fwd	
169	F.F ramp down back	
170	Kp (position hold)	
171	Kp Limit (position hold)	
172	Ki (position hold)	
173	Ki Limit (position hold)	
174		
175		
176		
177		
178		
179		
180		
181		
182		
183		
184		
185		
186		
187		
188		
189		
190		
191		
192	Software Version	
193		
194		
195		
196		
197	Probe Error Type	
198	Probe Scale	
199	Raw Probe Counts	

D.3 LOOP 2 POSITION CONTROL PARAMETERS

No	Name	Value
200		
201	Kerf	
202	Loop Type	
203	Park / Retract Distance	
204	Offset Distance	
205	Set Type	
206	Minimum Set Distance	
207	Backup Distance	
208		
209		
210	Limit Type	
211	Back Limit	
212	Forward Limit (Dogs In)	
213	Dogs Out Limit	
214	Flipper Limit	
215	Half Dog Limit	
216	Taper Limit	
217	Tong Dog Limit	
218		
219		
220	Probe Type	
221	Probe Invert	
222	Probe Offset	
223	Probe Stroke	
224	Probe Max Counts	
225	Probe Min Counts	
226	Loop Negative Offset	
227		
228		
229		
230	Output Drive Select	
231	Drive Output Invert	
232	Valve Dither	
233	Ramp Up Boost	
234	Ramp Down Boost	
235	Jog Limit Ramp	
236	Taper Left Scale Factor	
237		
238		
239		
240	Forward Drift	
241	Forward Deadband	
242	Forward Null	
243	Maximum Fwd Drive	
244	Forward Ramp Up	
245	Fwd Maximum Speed	
246	Forward Ramp Down	
247	Jog Fwd Ramp Down	
248	Jog Fwd Max Speed	
249	Jog Fwd Slow Speed	

No	Name	Value
250	Back Drift	
251	Back Deadband	
252	Back Null	
253	Maximum Back Drive	
254	Back Ramp Up	
255	Back Max Speed	
256	Back Ramp Down	
257	Jog Back Ramp Dwn	
258	Jog Back Max Speed	
259	Jog Back Slow Speed	
260	Kp setting	
261	Kp limit	
262	Ki setting	
263	Ki limit	
264	F.F ramp up fwd	
265	F.F ramp up back	
266	F.F max speed fwd	
267	F.F max speed back	
268	F.F ramp down fwd	
269	F.F ramp down back	
270	Kp (position hold)	
271	Kp Limit (position hold)	
272	Ki (position hold)	
273	Ki Limit (position hold)	
274		
275		
276		
277		
278		
279		
280		
281		
282		
283		
284		
285		
286		
287		
288		
289		
290		
291		
292	Software Version	
293		
294		
295		
296		
297	Probe Error Type	
298	Probe Scale	
299	Raw Probe Counts	

E. FAULT SHEET

Please fill out the sheet below and fax to Jaymor on **(+64) 7 847-0840** if a fault should occur. The information you provide will help us resolve your problem.

1) What is the fault you are experiencing?

2) What operation were you performing prior to the fault?

3) How often does the fault occur?

4) What is showing on the console displays?

POSITION DISPLAY: -----

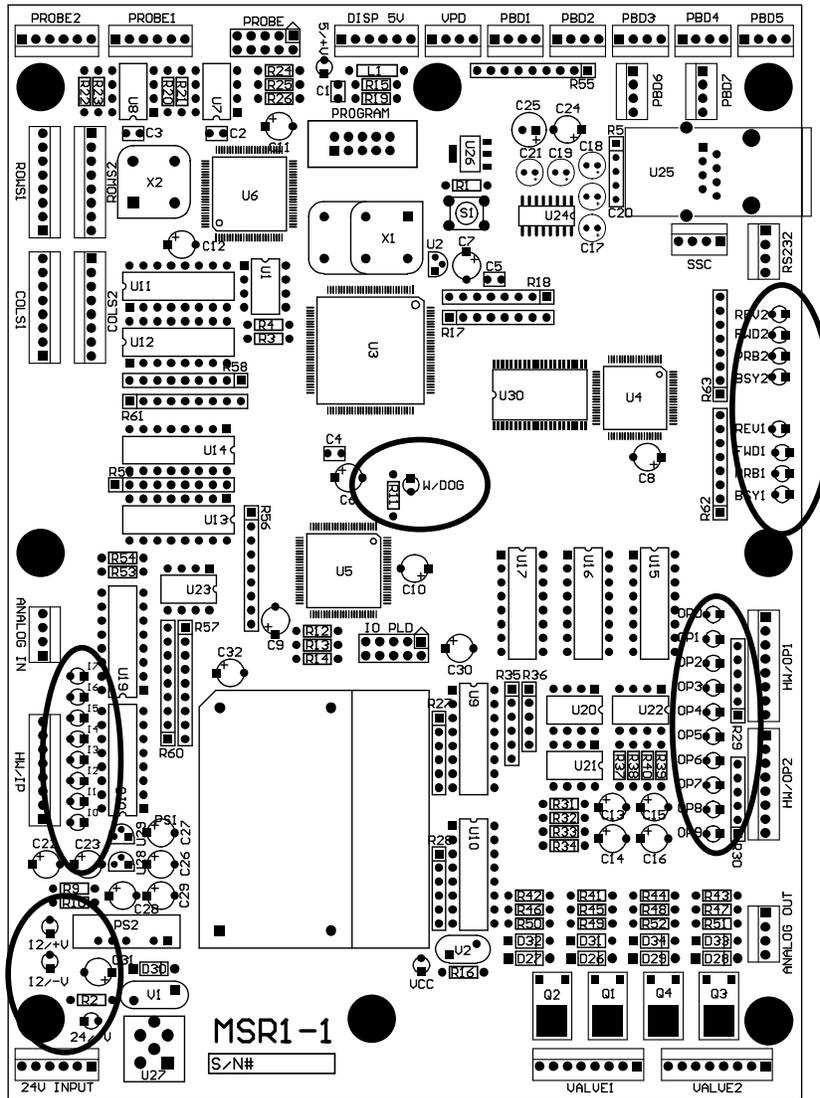
NEXT SET DISPLAY: -----

LAYER DISPLAY: -----

STATUS DISPLAYS (please mark the diagram below):

RUN	<input type="checkbox"/>	KEY PRESS
FLAG	<input type="checkbox"/>	RUN
E/STOP	<input type="checkbox"/>	PROBE
FWD LIM	<input type="checkbox"/>	BACK LIM
STACK	<input type="checkbox"/>	COM
1	<input type="checkbox"/>	2
3	<input type="checkbox"/>	4
5	<input type="checkbox"/>	6

What lights are on the control board? Please mark on the diagram below:



F. PARTS LIST

PART	DESCRIPTION		SERIAL NUMBER
MSR controller board	SUPPLIER	Jaymor Industries Ltd	
	P/N		
Pushbutton displays (2)	SUPPLIER	Jaymor Industries Ltd	
	P/N		
Vertical position display	SUPPLIER	Jaymor Industries Ltd	
	P/N		
Power Supply	SUPPLIER		
	P/N		
Pushbutton Membrane	SUPPLIER	Permark Ltd	
	P/N	MaxiMiser	
Hydraulic Valves	SUPPLIER		
	P/N		
Position Feedback	SUPPLIER		
	P/N		

