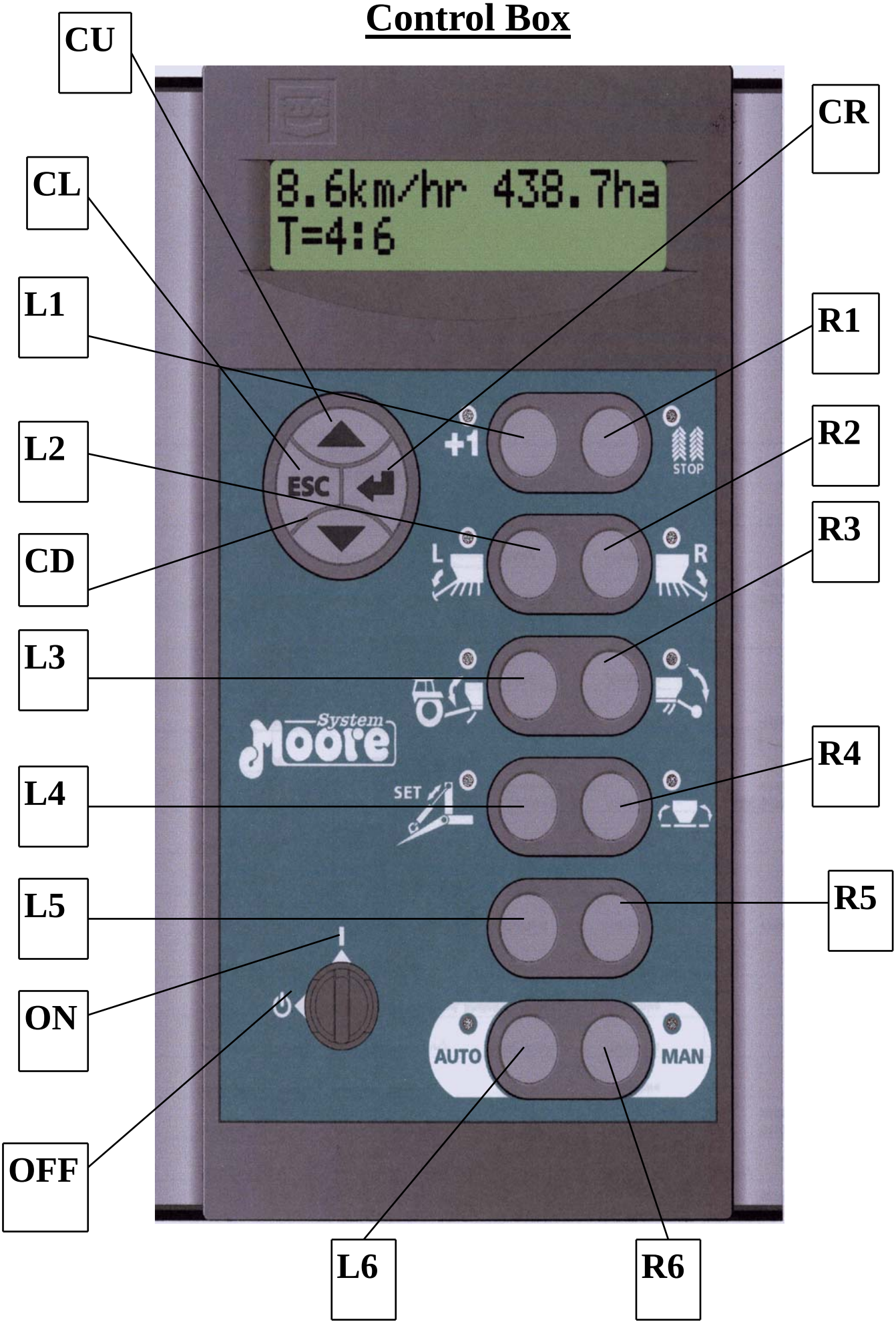
MOORE HEADLAND & DRILL CONTROL UNIT
Tandem Machine

A. INTRODUCTION

The Moore Headland & Drill Control instrument utilises Expert series hardware to perform the standard Multi Function Drill Control functions of the existing UDM J and also control the operation and sequencing of electro-hydraulic valves on the drill.

Control Box


CU
CR
CL
L1
R1
L2
R2
CD
R3
L3
R4
L4
R5
L5
ON
OFF
L6
R6
8.6km/hr 438.7ha
T=4:6
ESC
+1
STOP
L
R
System
Moore
SET
AUTO
MAN

OPERATION

The following indicates which operation each key performs.

Keys L1, R1, CU, CD, CL and CR are concerned with Multifunction Drill Control only.

Keys L2,L3, L4, L5, L6, R2, R3, R4, R5, R6 are concerned with Electro Hydraulic Control of Hydraulic Valves on the drill.

KEY L1

When pressed, this is the manual bout step.

KEY R1

When pressed in either Auto or Manual, the current bout is held and cannot be advanced with either key L1 or by the tramline advance sensor on the rear axle..

KEY CU

This key is used to scroll through the menus.

KEY CD

This key is used to scroll down through the menus.

KEY CR

This key is used to enter changes you have made to the menu.

KEY CL

This key is used to exit the menu that you are currently in.

KEY L2 Left Marker Solenoid

When pressed in Manual Mode, it will engage the Left Marker Solenoid, pressing again will turn off the Left Marker Solenoid.

KEY R2 Right Marker Solenoid

When pressed in Manual Mode, it will engage the Right Marker Solenoid, pressing again will turn off the Right Marker Solenoid.

KEY L3 Spare Button, (May be used to operated draw bar ram independent of rear axle ram in the future.

KEY R3 Head Land Lift Solenoid

When pressed in Manual Mode, it will engage the Headland Lift Solenoid, pressing again will turn off the Head Land Lift Solenoid.

KEY L4 Not Used

KEY R4 Wings Set Solenoid

When pressed in and held in Manual Mode, the Wing Fold Solenoid will be engaged when the drill is fully lifted. Releasing Key R4 turns off the Wing Fold Solenoid.

NOTE: Key R4 must be pressed in and also held in, before the solenoid will become energised.

NOTE: Electrical Solenoids may occasionally "Stick" and will not energise. It is possible to manually override this by pushing the brass plunger at the back of the solenoid with a screwdriver. Ensure the current is disconnected and that there is no oil pressure in the system.

KEY L5 Spare Button

No function.

KEY R5 Spare Button

No function.

Key L6 Manual Button

When pressed 'manual' mode is selected, in this mode, this allows independent control of the hydraulic services.

KEY R6 Automatic Headland Button

When pressed, the Auto Sequence is enabled which will Automate your headland turn.

The operator can control the way in which the markers are required to work in the auto sequence.

If the markers are not required, the operator should select auto, with no other functions on the display illuminated.

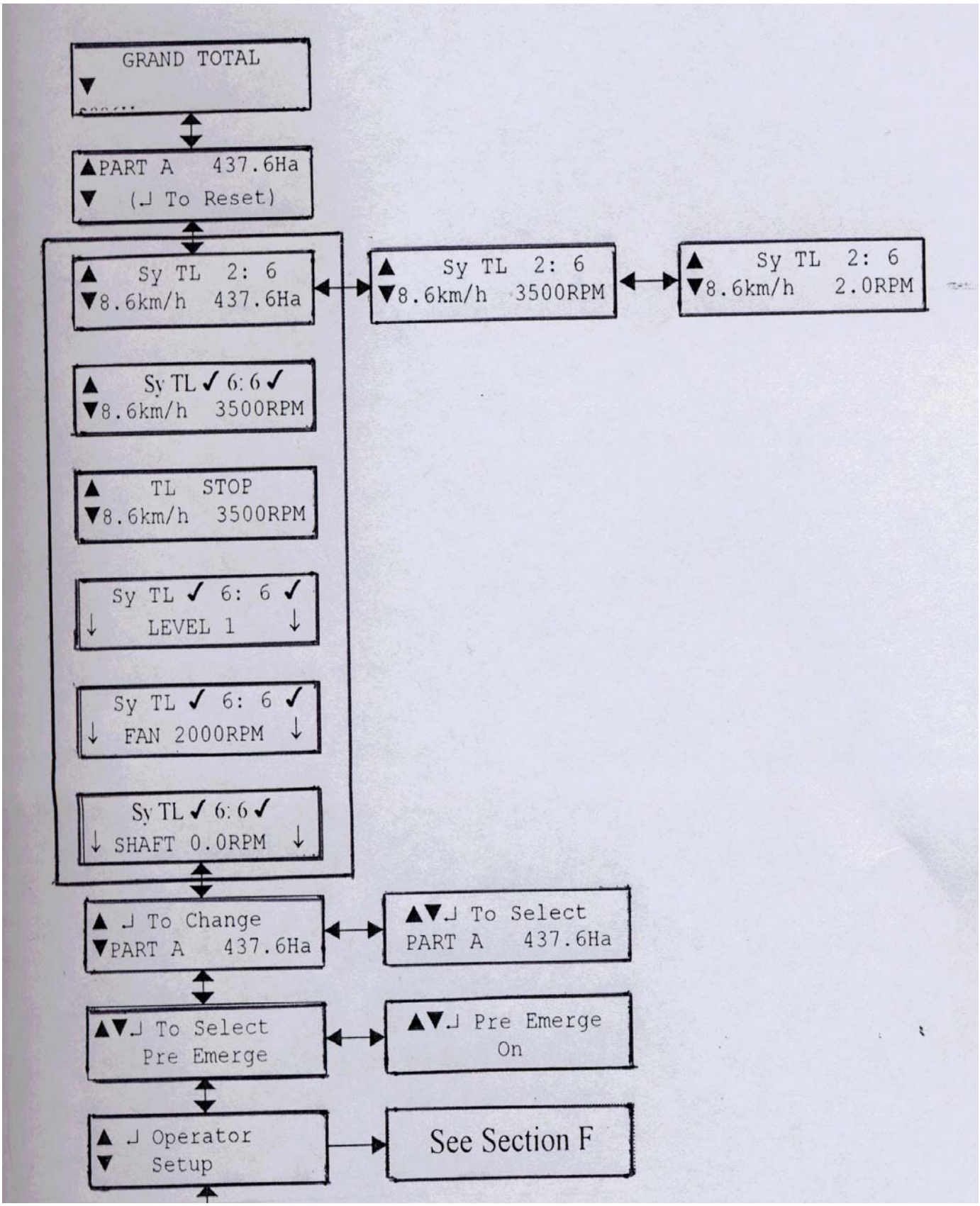
If both markers are required on the first bout, the operator should press both markers in manual mode, **then press auto**. And begin the auto sequence. When the operator has reached the end of the first drilling bout, lift the drill up full, and then select the marker that is required on the following bout, before lowering the drill back into work. And then continue on.

If the operator wants to begin drilling with the marker extend, which will mark the next drilling bout, the appropriate marker should be selected in manual mode, **then press auto.** and lower the drill into the first bout, the Moore Expert will then control the markers from then on.

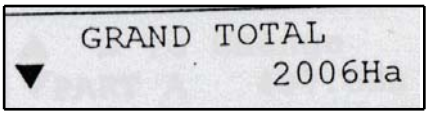
Note : The tramline count is taken from the rear axle, so if you have to lift the drill during a drilling bout always press **stop** (Key R1) to hold the tramline count.

Whilst in a drilling bout and you need to independently adjust one of the drill functions, e.g. Left Marker, press the manual button, then press Left Marker button, adjust with the spool lever, when the desired position is reached, press Left Marker button again, then press auto again, to get back into the bout sequence.

E. MAIN OPERATING MODE

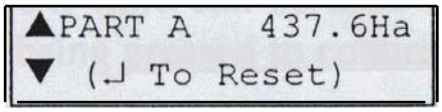


E.1



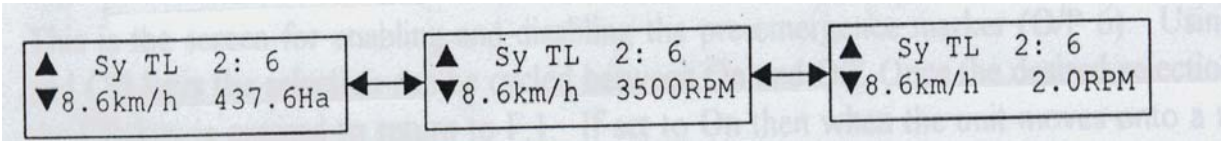
This is the non-reset able instruments accumulation of area. Resolution to 1 Ha.

E.2



This screen shows the Part area total on register A. Press the CR Key to reset the register to zero.

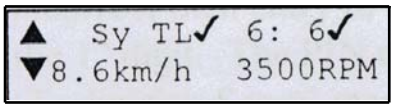
E.3



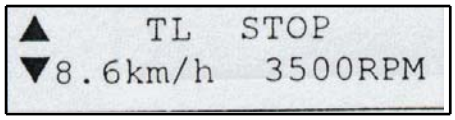
This is the conventional main operating display that the instrument will default to after 30 seconds from any of the other operating displays shown in section E. To cycle between the above 3 variations simply use the CR Key.

The top line of the display always shows the tramline status. 'Sy' indicates that rhythm is symmetrical. If the rhythm selected was asymmetric left than 'AL' would be shown, 'AR' for asymmetric right and '18 m' for the 18 metre rhythm. '2' is the current bout number and '6' is the target bout number. When upon a tram lining bout ticks will be sent to the left of the current bout number and to the right of the target bout number to indicate the outputs being on. If the rhythm is asymmetric left then only a left tick will be shown at the last and first bout of the sequence, vice versa if the rhythm selected is asymmetric right.

By cycling through the 3 displays the only information to change is that in the bottom right-hand corner. This could be the area register , the fan speed or the metering shaft speed .

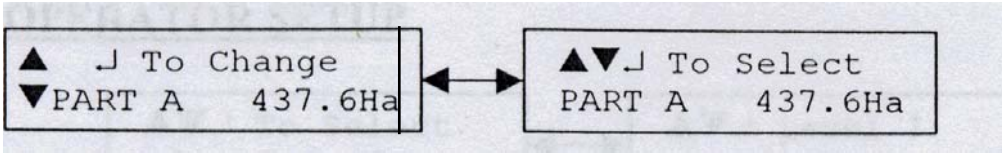


The above screen shows the ticks indicating both left and right outputs (O/P's 1 & 2) are switched on, as the current bout matches the target bout.



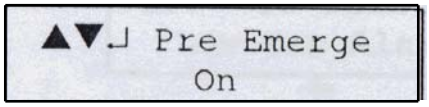
This screen shows that Key R1 has been pressed and the tramline count by I/P 5 has been stopped. This display will alternate between this and the normal display of tramline status on a 1 second basis. This will remain until Key R1 is pressed again.

E.4



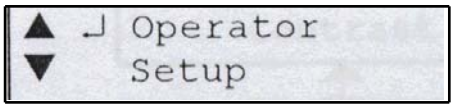
Press the CR Key on this screen allows the area register selected to be changed. Once this key has been pressed, the area register digit flashes opposite to the cursor below it and the CU and CD Keys can be used to cycle through the selection of registers from A - F, with the CR Key being pressed to confirm the selection.

E.5



This is the screen for enabling and disabling the pre-emergence marker (O/P 6). Using the CU and CD Keys the selection can be cycled between On and Off. Once the desired selection is made the CR Key is pressed to return to F.1. If set to On then when the unit moves onto a tram lining bout, O/P 6 will be operated as well as O/P's 1 & 2.

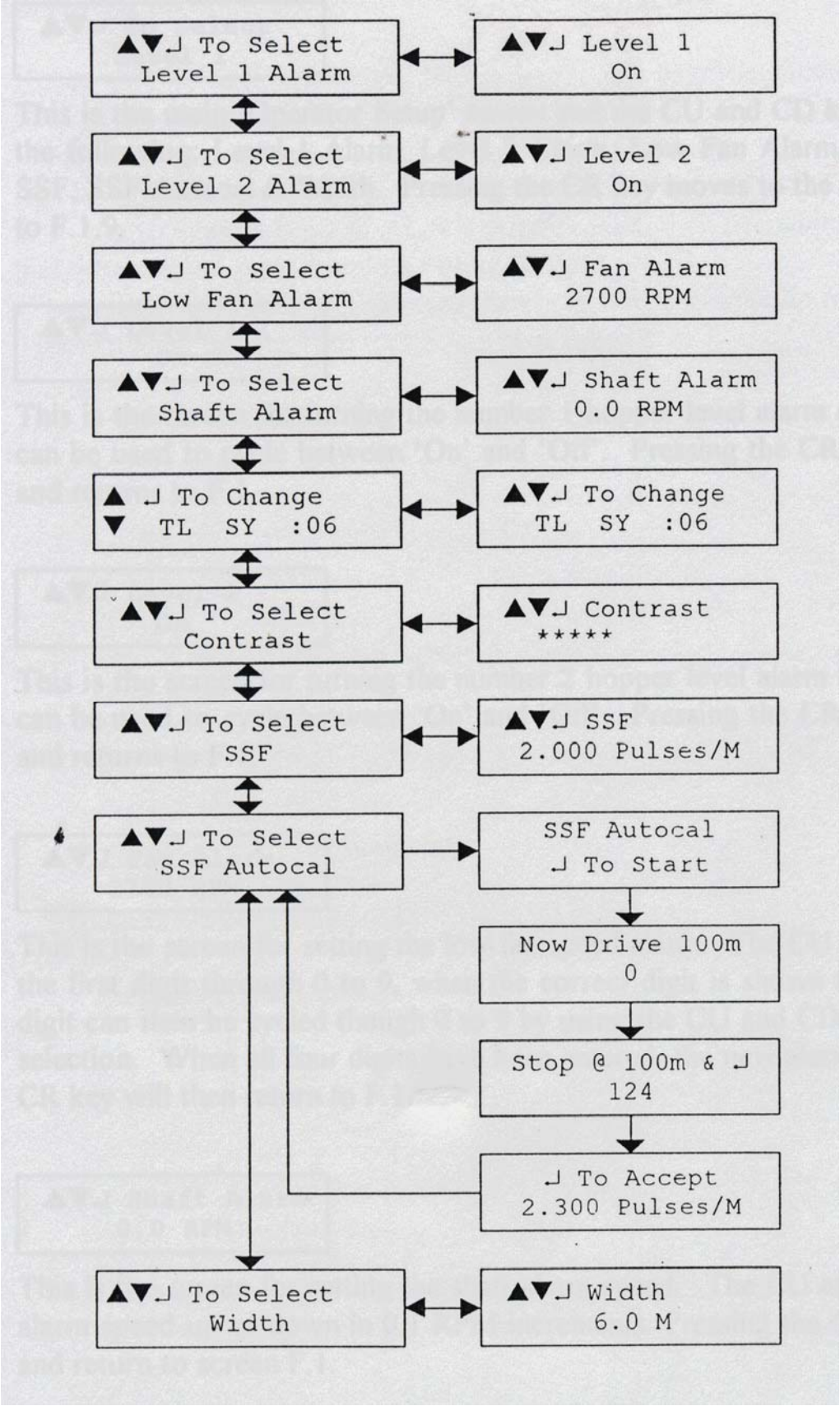
E . 6



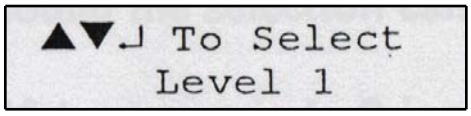
Pressing the CR Key at this screen will move you into the 'Operator Set-up' menu, see section f.

To get into the Technician Setup see attached sheet.

F. OPERATOR SETUP

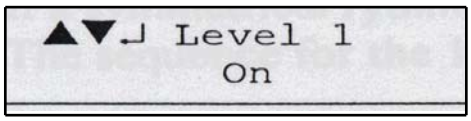


F.1



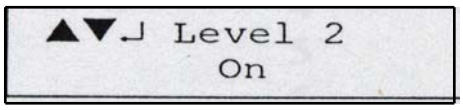
This is the main ‘Operator Set-up’ screen and the CU and CD Keys can be used to cycle through the following: Level 1 Alarm, Level 2 Alarm, Low Fan Alarm, Shaft Alarm, TL Set, Contrast, SSF, SSF Auto cal and Width. Pressing the CR Key moves to the required screen, see section F.1.1 to F.1.9.

F1.1



This is the screen for tuning the number 1 hopper level alarm On and Off. The CU and CD Keys can be used to cycle between ‘On’ and ‘Off’. Pressing the CR Key confirms the selection made and returns to F.1.

F1.2

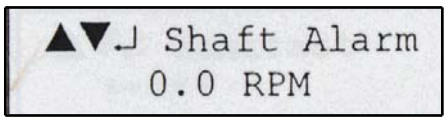


This is the screen for turning the number 2 hopper level alarm On and Off. The CU and CD Keys can be used to cycle between ’On’ and ‘Off’. Pressing the CR Key confirms the selection made and returns to F.1.

F1.3

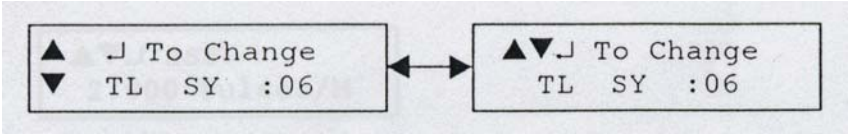
This is the screen for setting the low fan speed alarm. The CU and CD Keys can be used for cycling the first digit through 0 to 9, when the correct digit is shown the CR Key is pressed. The next digit can then be cycled through 0 to 9 by using the CU and CD Keys, the CR Key confirming the selection. When all four digits have been entered, the new alarm speed will be seen, pressing the CR Key will then return to F.1.

F1.4



This is the screen for setting the shaft alarm speed. The CU and CD Keys are used to cycle the alarm speed up or down in 0.1 RPM increments. Pressing the CR Key will confirm the speed set and return to screen F.1.

F.1.5



Pressing the CR Key on this screen allows the tramline rhythm selected to be changed. Once this key has been pressed, the type of rhythm flashes opposite to the cursor below it. The CU and CD Keys can be used to cycle through 'SY' (Symmetrical), 'AL' (Asymmetric Left), 'AR' (Asymmetric Right) and '18 m' (the 18 m rhythm). Once this selection has been confirmed with the CR Key the target number of bouts will then flash opposite to the cursor below it. The target number can be scrolled up and down using CU and CD Keys between 01 and 12. Once the desired number is found the selection can be confirmed using the CR Key.

If Asymmetric Left is selected, then output T/L 1 only is switched on for the last bout and the first bout of sequence.

If Asymmetric Right is selected, then output T/L 2 only is switched on for the last bout and the first bout of the sequence. E.g. If a tram lining bout of AL 6 is programmed, then tram lining will be engaged on both bouts 1 and 6 on the left-hand tramline output (output T/L 1).

If a Symmetrical rhythm is selected then both outputs come on for only the tram lining bout.

The sequence for the 18 m tram lining is as follows;

BOUT NUMBER	TRAMLINE OUTPUT
1	-
2	-
3	O/P 1
4	-
5	-
6	-
7	O/P 2
8	-
9	-
10	-
11	-
12	O/P 2
13	-
14	-
15	-
16	O/P 1
17	-
18	-

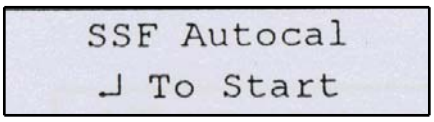
F.1.6

This is the contrast setting screen. *'s are shown as solid blocks and the CU and CD Keys are used to increase or decrease the contrast. Pressing the CR Key returns to F.1.

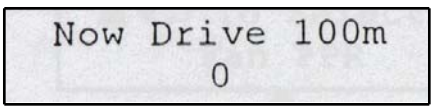
F.1.7

This is the screen for entering the Theoretical Speed Sensor factor manually. The first digit will flash and the CU and CD Keys can be used for cycling through from 0 to 9. With the desired number shown, the CR Key can be pressed to confirm and move to the next digit, which will then flash. When all four digits have been entered the new factor will be shown, pressing the CR Key then will return to screen F.1.

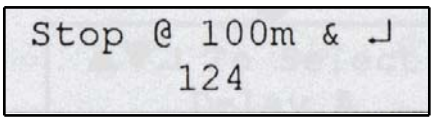
F.1.8



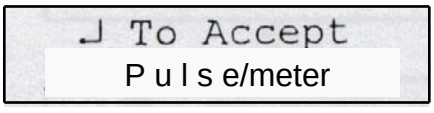
This is the first screen of the speed sensor auto cal procedure. When the drill is at the beginning of the 100 m mark, press the CR Key to start the procedure.



This screen now tells the operator to start driving towards his 100 m marker. The pulses received will be shown on the bottom line of the display.

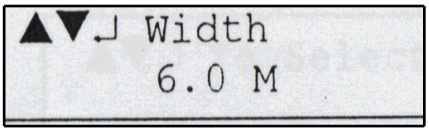


This screen is seen when 10 pulses have been received. The top line of the text changes to tell the operator to stop on the 100 m mark and then press the CR Key.



The newly calculated speed sensor factor is shown the bottom line of the display with the top line indicating to press the CR Key to except this new value. Once the CR Key has been pressed it will return to F.1, the newly calculated factor being substituted into F.1.6.

F.1.8

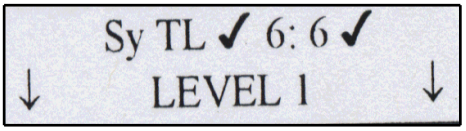


This is the screen for entering the working width of the drill. Using the CU and CD Keys the width can be increased or decreased in 0.1 m increments. Once the desired width is set the CR Key is pressed to confirm and return to F.1.

ALARMS/WARNINGS

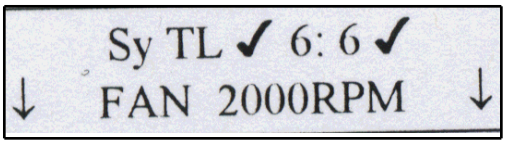
All alarms are inhibited if the forward speed is below 2 km/h.

H.1



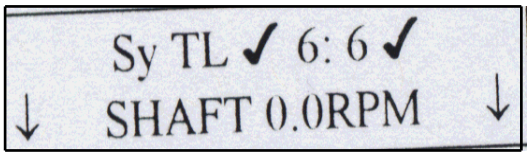
This screen is a variation of E.3. The tramline is retained but the button line shows that the hopper level 1 is low (I/P6). When I/P 6 is open, then the instrument will default to this screen, beep 5 times, the down arrows will also flash on and off. The alarm will reset when the I/P closes to 0 volts or it can be ignored by pressing the CL Key.

H.2



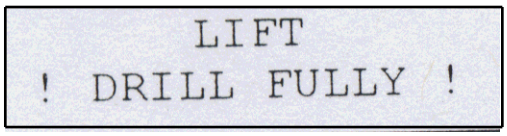
This screen shows the fan speed (I/P 2) is below the alarm level set. The instrument will default to this screen, beep 5 times and the down arrows will also flash on and off. The alarm will reset when the correct speed is obtained or it can be ignored by pressing the CL Key. The same screen and alarm conditions being used if the fan exceeds its maximum speed, although this time the down arrows will be replaced with up arrows.

H.3



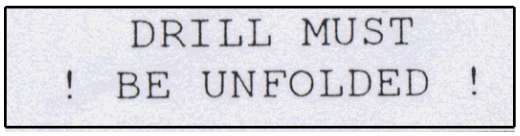
This screen shows that the shaft speed (I/P 8) is below the alarm level set. The instrument will default to this screen, beep 5 times and the down arrows will also flash on and off. The alarm will reset when the correct speed is obtained or it can be ignored by pressing the CL Key. Due to the slow rotational speed of this shaft the alarm condition only exists if there is no shaft speed input for 40 seconds.

H.4



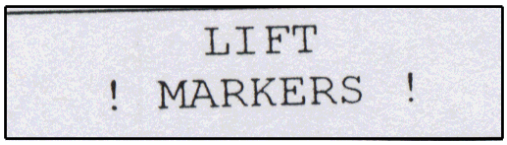
This screen is shown if Key R4 is pressed in ‘Manual’ mode and I/P 11 is not closed to 0 volts.

H.5



This screen is shown if either Key L2 or R2 is pressed and I/P 9 is not closed to 0 volts.

H.6



This screen in shown when Key R4 is pressed and I/P 5 is not closed to 0 volts.

Setting of Moore Expert in Technician Mode

Technician Pin No. 5696

A. High Fan alarm **4200 RPM**

B. Fan PPR **1.0**

C. Shaft PPR **3.0**

Setting of delays

1. Set A to 1.

2. Increase the oil flow through the markers so that they come up fully in the same time that it takes for the wheels to go down.

If this is not possible increase A which will keep the marker coming up after the wheels are fully down, until the markers will fully raise at the headland.

3. **Set C and E to zero and never adjust**. These factors are only required if separate marker sensors are fitted. If the bout advance is taken off the wheels down sensor then they will not need adjusting from 0 seconds.

4. **Delay G should be OK at 3 seconds**. This is the time delay before the marker starts to lower when the drill is being dropped into work. It could be set anywhere between zero and 5 seconds with little affect on the sequence. It was intended to prevent the marker from lowering if the operator started to lower the drill whilst still turning. If this is not the case then set to zero.

5. **Delay J Not needed set to zero**