Burny 2.5 PLUS Update

Installation instructions for field upgrades using the Burny 2.5 PLUS processor card.

Also for use with MO-12685 and MO-12742 upgrade kits

ECO REVISION HISTORY

Revision	*Description*	*ECO*	*Date*
-AA	Written	---	28-July-00
-BA	Add photos, DIP Switch and parameter for old cards	CLE1716	07-Dec-00

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Cleveland Motion Controls
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REVISION HISTORY

Rev AA	RDM (28-July-2000) -- Written
Rev BA	JRB (7-Dec-2000) -- Added retrofit Figures and references
	RDM(7-Dec-2000) -- Add APPENDIX A,B for Dip switch settings for older front panels, and APPENDIX B for modifications needed to Encoder Scaling parameters when MO-3370 or 4873 or 4875 board was replaced.

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1. INTRODUCTION

These instructions document the steps needed to update existing Burny 2.5 controls, or any of the other Series 2 controls (1250,1400, 2.8, 2.9) with the new MO-12438 Burny 2.5 Plus processor card. The procedure assumes the installer is familiar with the Burny products and is capable of the mechanical assembly/disassembly and entry of parameters into the system.

For updates on a Burny 1250 or Burny 1400 system, the original keyboard can still be used—just the processor card is replaced as described in the following procedures.

For Burny 2.5, Burny 2.8 or Burny 2.9 systems, a special part number MO-12685 has been created to provide a new processor card with the new 2.5 Plus keyboard. This is necessary since the older Burny 2.5 keyboards do not have the proper clearance in the aluminum panel for the current readout used on the Burny 2.5 products. By ordering this MO-12685 kit, the installer is assured of having a panel that works fits the readout.

The main purpose of this particular procedure is to document all of the stored parameters, option codes, Aux code conversion tables, etc. which are configured in the existing Series 2 control BEFORE the new processor card is installed. Once the new card is operational, this stored data from the old system will be re-entered with the goal of making the new card capable of running the machine in as little time as possible.

2. PARAMETER and SYSTEM DATA RETRIEVAL

Before disassembling anything, the installer must first retrieve all the data stored in the existing Burny 2.5 system. There is no automatic way to do this with the older software, therefore the data must be manually obtained. The following pages have procedures and tables to be used to write down the parameter data, Code Conversion table data, and options enabled in the current system. Then, after the new processor card and panel are installed, these values must be manually re-entered into the new system. If this process is done correctly, and attention is paid to getting the data correct, the new system should begin operation with no further tuning required.

2.1 System Data Parameters-SERV10

With the existing system operating normally, press the hidden "SERVICE" button and access SERV10-SYS DATA. Press ENTER to display the main system parameter list. The display shows the first parameter as:

SD01-ARC ON DELAY

Press the ENTER button a second time to display the value currently set for this parameter—if the Arc On delay had been set for 3 seconds, the display would now show:

AONDLY = 3.00

Write down this 3.00 value in the following table. Press the ENTER button to access the next parameter name, and then press the ENTER button a second time to access the value—the display would have showed:

SD02-BLEEDOFF then BLEDOF= 2.00 (2 seconds used for this example)

Continue stepping through the entire list of parameters and write their values in the able provided.

IMPORTANT: Older systems may not include all the parameters shown on this list.

Older systems had less parameters than the current Burny 2.5—therefore it is important to carefully pay attention to the parameter number displayed on the screen, and match it to the table before writing the value. Any parameters that were not included in the old system will be handled during the installation portion for the new card.

2.1.1 SERV10 PARAMETERS

Parameter Number and Name	PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN	Default value to be used for older systems where a parameter was not part of the older products list.	Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system
SD01- ARC ON TIME	ARCDLY =		
SD02- BLEEDOFF	BLEDOF =		
SD03- ACCEL TIME	ACCTME =		
SD04- MAX DRV SPD	MAXSPD =		
SD06- BACKUP SPD	BCKSPD =		
SD07- CORNER SPD	CORSPD =		
SD08- MIN HLD SPD	MINHLD =		
SD09- ERR SPD MAX	ERRSPD =	20 inch/min 400 mm/min	

SD10- RUNSPD LIMIT	RUNLMT =		
SD11- TRAVERS LMT	TRVLMT =		
SD12- MIN ACCEL	MIN ACCEL =	.20 seconds	
SD14- GAIN BREAK	GAIN BREAK =	0	
SD15- ERR WRN DST	WRNDST =		
SD16- LOOP GAIN	LPGAIN =		
SD17- ARC OFF DLY	AOFDLY =	2.0 seconds	
SD18- SLWDWN DIST	SLWDST =		
SD19- DISABL DIST	DISABL =	.25 inches 6.3 mm	
SD20- X ENC DIST	XENSCL =		
SD21- Y ENC DIST	YENSCL =		
SD22- ENC LIN/REV	ENC LINES =		
SD23- X ENC DIR	X ENC DIR -		
SD24- Y ENC DIR	Y ENC DIR -		
SD25- X DRV DIR	X DRV DIR -		
SD26- Y DRV DIR	Y DRV DIR -		
SD27- PLATE SIDE	PLATE ON -		
SD28- HEIGHT RLY	CONTACT -		
SD29- SLWDWN RAD	SLWRAD =		
SD30- MIN RAD SPD	MRADSP =	30 inches/min 150 mm/min	
SD31- PLASMA TB1	PLASMA TB1 =	NO	
SD32- MIN SLW ANG	MINSLW =	10	
SD33- MAX SLW ANG	MAXSLW =	22	
SD40- X MARK OFF	XOFST1 =		
SD41- Y MARK OFF	YOFST1 =		
SD42- MARKER SPD	MRKSPD =		
SD43- MARK DELAY	MRKDLY =		
SD45- DEFLT DWELL	DFDWEL =		
SD46- MIN OFF DWL	MINOFF =		
SD47- XOFST2	XOFST2 =		

SD48- YOFST2	YOFST2=		
SD49- START DELAY	STRDLY =	1.5 seconds	
SD50- SERIAL DEFN	SERIAL DEFN =		
SD5- PRGM FORMAT	PGMFMT =		
SD52- SPECIAL EOP	EOP 1 =		
SD53- FILE EXTEN	FEXTEN =	434E4300	
SD60- OPER SYS	OPER SYS =		
SD61- SYS CONFG 1	SYSCFG1 =		
SD62- SYS CONFG 2	SYSCFG2 =		
SD63- SYS CONFG 3	SYSCFG3 =	0	
SD65- OVERLAY CFG	OVERLAY CFG =	0	
SD68- SPEED RANGE	SPEED RANGE =	4	
SD69- LA NGUAGE	LANGUAGE =	0	
SD70- KNF ROT DIA	KNFDIA =		
SD71- KNF B.P. ANG	KNF B.P. ANG =		
SD74- T2XHOM	T2XHOM =		
SD75-T2YHOM	T2YHOM =		
SD76- T3XHOM	T3XHOM =		
SD77- T3YHOM	T3YHOM =		
SD78- T4XHOM	T4XHOM =		
SD79- T4YHOM	T4YHOM =		
SD80- XOFST1	XOFST1 =		
SD81- XOFST1	YOFST1 =		
SD82- XOFST2	XOFST2 =		
SD83- XOFST2	YOFST2 =		
SD84- XOFST3	XOFST3 =		
SD85- XOFST3	YOFST3 =		
SD86- XOFST4	XOFST4 =		
SD87- XOFST4	YOFST4 =		
SD88- XOFST5	XOFST5 =		

SD89- XOFST5	YOFST5 =		
SD90- XOFST6	XOFST6 =		
SD91- XOFST6	YOFST6 =		
SD92- XOFST7	XOFST7 =		
SD93- XOFST7	YOFST7 =		
SD94- XOFST8	XOFST8 =		
SD95- XOFST8	YOFST8 =		
SD96- XHOMSW	XHOMSW =		
SD97- XHOMSW	YHOMSW =		
SDA0- XBKLSH	XBKLSH =	0	
SDA1- YBKLSH	YBKLSH =	0	
SDA2- LSH RATE	LSH RATE =		
SDD0- SYNC W-AXIS	SYNC ENABLE =	NO	
SDD1- W GAIN	W GAIN =		
SDD2- SKEW LIMT	SKWLMT =		
SDD3- W MAX SPD	WMXSPD =		
SDD4- W ENC DIR	W ENCODER =		
SDD5- W DRV DIR	W DRIVE =		
SDD6- WBKLSH	WBKLSH =		
SDD7 – W OFFSET	WOFSET =		

2.2 System Overlay Table #1 Parameters - SERV41

Burny 2.5 systems built after 1983 had the 5 sets of additional setup parameters which could be selected by programming codes within a part program to "overlay" the standard SERV10 parameter list. Access this list of values by pressing the hidden "SERVICE" button and access SERV41-TB 1 DATA. Press ENTER to display the overlay table #1 list. Note this list is much shorter than the SERV10 list. Again, carefully step down through the list and write the values in the following list:

2.2.1 SERV41 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
1-03- ACCEL TIME	ACCTME =		
1-07- CORNER SPD	CORSPD =		
1-10- RUNSPD LIMIT	RUNLMT =		
1-12- MIN ACCEL	MIN ACCEL =		
1-14- GAIN BREAK	GAIN BREAK =		
1-16- LOOP GAIN	LPGAIN =		
1-18- SLWDWN DIST	SLWDST =		
1-19- DISABL DIST	DISABL =		
1-29- SLWDWN RAD	SLWRAD =		
1-30- MIN RAD SPD	MRADSP =		
1-32- MIN SLW ANG	MINSLW =		
1-33- MAX SLW ANG	MAXSLW =		
1-45- DEFLT DWELL	DFDWEL =		
1-46- MIN OFF DWL	MINOFF =		
1-49- START DELAY	STRDLY =		

2.3 System Overlay Table #2 Parameters - SERV42

Continue with this process to access the data in Overlay Table #2 by pressing the hidden "SERVICE" button and access SERV42-TB 2 DATA. Press ENTER to display the overlay table #2 list.

2.3.1 SERV42 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
2-03- ACCEL TIME	ACCTME =		
2-07- CORNER SPD	CORSPD =		
2-10- RUNSPD LIMIT	RUNLMT =		
2-12- MIN ACCEL	MIN ACCEL =		
2-14- GAIN BREAK	GAIN BREAK =		
2-16- LOOP GAIN	LPGAIN =		
2-18- SLWDWN DIST	SLWDST =		
2-19- DISABL DIST	DISABL =		
2-29- SLWDWN RAD	SLWRAD =		
2-30- MIN RAD SPD	MRADSP =		
2-32- MIN SLW ANG	MINSLW =		
2-33- MAX SLW ANG	MAXSLW =		
2-45- DEFLT DWELL	DFDWEL =		
2-46- MIN OFF DWL	MINOFF =		
2-49- START DELAY	STRDLY =		

2.4 System Overlay Table #3 Parameters - SERV43

Continue with this process to access the data in Overlay Table #3 by pressing the hidden "SERVICE" button and access SERV43-TB 3 DATA. Press ENTER to display the overlay table #3 list.

2.4.1 SERV43 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
3-03- ACCEL TIME	ACCTME =		
3-07- CORNER SPD	CORSPD =		
3-10- RUNSPD LIMIT	RUNLMT =		
3-12- MIN ACCEL	MIN ACCEL =		
3-14- GAIN BREAK	GAIN BREAK =		
3-16- LOOP GAIN	LPGAIN =		
3-18- SLWDWN DIST	SLWDST =		
3-19- DISABL DIST	DISABL =		
3-29- SLWDWN RAD	SLWRAD =		
3-30- MIN RAD SPD	MRADSP =		
3-32- MIN SLW ANG	MINSLW =		
3-33- MAX SLW ANG	MAXSLW =		
3-45- DEFLT DWELL	DFDWEL =		
3-46- MIN OFF DWL	MINOFF =		
3-49- START DELAY	STRDLY =		

2.5 System Overlay Table #4 Parameters - SERV44

Continue with this process to access the data in Overlay Table #4 by pressing the hidden "SERVICE" button and access SERV44-TB 4 DATA. Press ENTER to display the overlay table #4 list.

2.5.1 SERV44 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
4-03- ACCEL TIME	ACCTME =		
4-07- CORNER SPD	CORSPD =		
4-10- RUNSPD LIMIT	RUNLMT =		
4-12- MIN ACCEL	MIN ACCEL =		
4-14- GAIN BREAK	GAIN BREAK =		
4-16- LOOP GAIN	LPGAIN =		
4-18- SLWDWN DIST	SLWDST =		
4-19- DISABL DIST	DISABL =		
4-29- SLWDWN RAD	SLWRAD =		
4-30- MIN RAD SPD	MRADSP =		
4-32- MIN SLW ANG	MINSLW =		
4-33- MAX SLW ANG	MAXSLW =		
4-45- DEFLT DWELL	DFDWEL =		
4-46- MIN OFF DWL	MINOFF =		
4-49- START DELAY	STRDLY =		

2.6 System Overlay Table #5 Parameters - SERV45

Continue with this process to access the data in Overlay Table #5 by pressing the hidden "SERVICE" button and access SERV45-TB 5 DATA. Press ENTER to display the overlay table #5 list.

2.6.1 SERV54 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
5-03- ACCEL TIME	ACCTME =		
5-07- CORNER SPD	CORSPD =		
5-10- RUNSPD LIMIT	RUNLMT =		
5-12- MIN ACCEL	MIN ACCEL =		
5-14- GAIN BREAK	GAIN BREAK =		
5-16- LOOP GAIN	LPGAIN =		
5-18- SLWDWN DIST	SLWDST =		
5-19- DISABL DIST	DISABL =		
5-29- SLWDWN RAD	SLWRAD =		
5-30- MIN RAD SPD	MRADSP =		
5-32- MIN SLW ANG	MINSLW =		
5-33- MAX SLW ANG	MAXSLW =		
5-45- DEFLT DWELL	DFDWEL =		
5-46- MIN OFF DWL	MINOFF =		
5-49- START DELAY	STRDLY =		

3. Retrieving Custom Aux Table Data – SERV78

The Burny 2.5 has the ability to convert the M and G or ESSI auxiliary functions in a part program into the functional codes needed by the Burny to cut the part. The data for making this conversion is contained in a list accessed by pressing the hidden "SERVICE" button, and then selecting the SERV78-CUSTOM AUX utility. Press ENTER to access the first entry in the list. There are 2 display formats used with this list—when the table is first accessed, the display will be in the "Table position" mode which shows which of the 50 possible entries is being displayed, and the current setting for that table location:

AUX01-M20-CUTOFF

This indicates that the first table location "AUX01" contains the data to convert an M20 code from a word address program into an internal Cut Off function—turn the oxygen or plasma off at the end of a cut.

Pressing ENTER at this point changes the display to show the TVVFF code for the AUX01 entry—the display will appear as:

32005-M20-CUTOFF

The 32005 is the TVVFF code:

T -- a single digit that defines the type of code begin converted (1-ESSI, 2-G code, 3-M code)

VV – a 2 or 3 digit value (up to 127) that defines the numeric value for the code (20 in this example)

FF – a 2 digit code defining the internal function assigned to the code (see Burny 2.5 manual for the list)

It is NOT necessary to understand what all these codes do to install the Burny 2.5 Plus processor card--- the important thing is to get them written down in the following chart so they can be re-entered in the new control.

The procedure would be to step through the list for each of the AUX entries and write down the data displayed for the block and the TVVFF displays.

While this list contains a maximum of 50 entries, the number of AUX table entries is usually much less. The end of the list is indicated by a display of a location being AVAILABLE. This means that no data has been entered for this table entry—the Burny will not search the table past this AVAILABLE location therefore any data following the first AVAILABLE location is not needed—it would not affect the controls operation in any way.

Begin stepping through the list and write down the data in the following chart:

3.1.1 AUX CODE TABLE DATA

Table location display: Example: AUX01 – M20 – CUT OFF	TVVFF display Example:32005 – M20 – CUT OFF
AUX01 -- --	-- --
AUX02 -- --	-- --
AUX03 -- --	-- --

AUX04	--	--	--	--
AUX05	--	--	--	--
AUX06	--	--	--	--
AUX07	--	--	--	--
AUX08	--	--	--	--
AUX09	--	--	--	--
AUX10	--	--	--	--
AUX11	--	--	--	--
AUX12	--	--	--	--
AUX13	--	--	--	--
AUX14	--	--	--	--
AUX15	--	--	--	--
AUX16	--	--	--	--
AUX17	--	--	--	--
AUX18	--	--		
AUX19	--	--		
AUX20	--	--		
AUX21	--	--		
AUX22	--	--		
AUX23	--	--		
AUX24	--	--		
AUX25	--	--		
AUX26	--	--		
AUX27	--	--		
AUX28	--	--		
AUX29	--	--		
AUX30	--	--		
AUX31	--	--		
AUX32	--	--	--	--
AUX33	--	--	--	--
AUX34	--	--	--	--
AUX35	--	--	--	--
AUX36	--	--	--	--

AUX37	--	--	--	--	
AUX38	--	--			
AUX39	--	--			
AUX40	--	--			
AUX41	--	--			
AUX42	--	--			
AUX43	--	--			
AUX44	--	--			
AUX45	--	--			
AUX46	--	--			
AUX47	--	--			
AUX48	--	--			
AUX49	--	--			
AUX50	--	--			

4. OPTION CODES

All of the Burny 2.5 and related Series 2 controls have various software options that are enabled by special "Lockout" codes based on the serial number of the control. While the new Burny 2.5 Plus card has all "options" now loaded as standard features, the Option Settings for the old board must be documented to determine some of the parameter settings on the new board.

There are two ways that this is done, depending on the age of the software in the existing control.

4.1 Option code display on very old systems.

Very old systems only display the options as a coded text string during power-up. The control will turn on and go through it's normal tests, and then display a text string as:

OPTN- C2D4007000

Each digit in this display references a particular option.

Turn the power Off, and back On to the control, and wait for this string to appear—then record the value in the following spaces (it may take several cycles of power Off/On to get the entire string written down correctly).

OPTN										

4.2 Option code display on newer Burny 2.5 (Series 2) systems

Controls with more recent software will have a display function called DSPY80 which tells the ON/OFF status of each option directly on the screen. Press the DSPY button and select DSPY80. When the ENTER button is pressed, the display will first show a sequence of values showing the serial number, hardware type and how much memory is used. Press the ENTER button during this sequence and the display will change to show:

OPTIONS

KERF --- ON or KERF --- OFF

Pressing enter will step down through this list and show the status of each option as ON or OFF. Record these values in the following chart for later use. Some of these options may not appear in the list since they are now considered "standard"—the chart has locations for them to make the recording process easier

4.2.1 Option ON/OFF status

OPTION NAME	ON/OFF
KERF	
SCALE	
ROTATE	
MIRROR	
PLATE ALIGN	
SERIAL COMM	
COMM ENHANCE	
CAD LINK	
PLATE MARKER	
STD. SHAPES	
TEACH	
KNIFE KERF	
CUSTOM AUX.	
LANGUAGE or individual language such as SPANISH, FRENCH, GERMAN, etc.	
FLOPPY DRIVE	
PRG. FDRT/KRF (programmable feedrate and kerf)	

5. BACKUP PART PROGRAMS

The final section of data that must be transferred from the existing Burny 2.5 to the new Burny 2.5 PLUS card are the stored part programs in the control. Part programs could have been created by either loading a Standard Shape, Template Teach, Downloading a program from the serial port or a Floppy, or creating a program using the Editor.

When the old processor card is removed from the system, these programs will be lost unless they are backed up to some external device. Some customers will already have all of their programs stored on the host computer, so there is no need to backup the data from the Burny 2.5. However, other customers will have programs created by template teach, that are only stored in the Burny 2.5's memory—these programs should be backed up if possible.

This can be done in two ways.

If the system is equipped with a serial port, and the external computing device can accept program uploads, use the STORE function in the Burny 2.5 to store to the RS-232 port and send all the internal programs up to the host computer.

If the system is equipped with an internal or external Floppy Disk drive, use the STORE function in the Burny 2.5 and store the programs to a series of floppy disks so they can be reloaded into the new card.

6. Power Off—Swap processor cards

Now that all the data from the existing Burny 2.5 processor card has either been stored to some external device, or recorded on this document on the lists provided, the old card can be removed, and the new card installed.

IMPORTANT: Remove all sources of AC power to the machine before performing any service work. The main power disconnect should be turned off and Locked in the OFF state to prevent someone from accidentally turning the power back on during the service operation.

WARNING: Proper handling procedures must be followed when installing the new MO-12438 Burny 2.5PLUS processor card. This card contains many high speed, high density electronic devices that can be damaged by STATIC ELECTRICITY caused by improper handling. Before removing the card from it's protective bag, the installing technician MUST use a grounded anti-static wrist strap connected to the machine chassis. All sources of STATIC ELECTRICITY should be removed from the area (any styrofoam, plastic packing material, bubble wrap, plastic paper sleeve protectors, etc). Once the board is removed from it's protective bag, it should be installed directly into the Burny system—do not lay it on a table or other surface that may not be grounded.

**The existing Burny 2.5 processor card should be placed back into the same protective anti-static bag after it is removed from the system. **

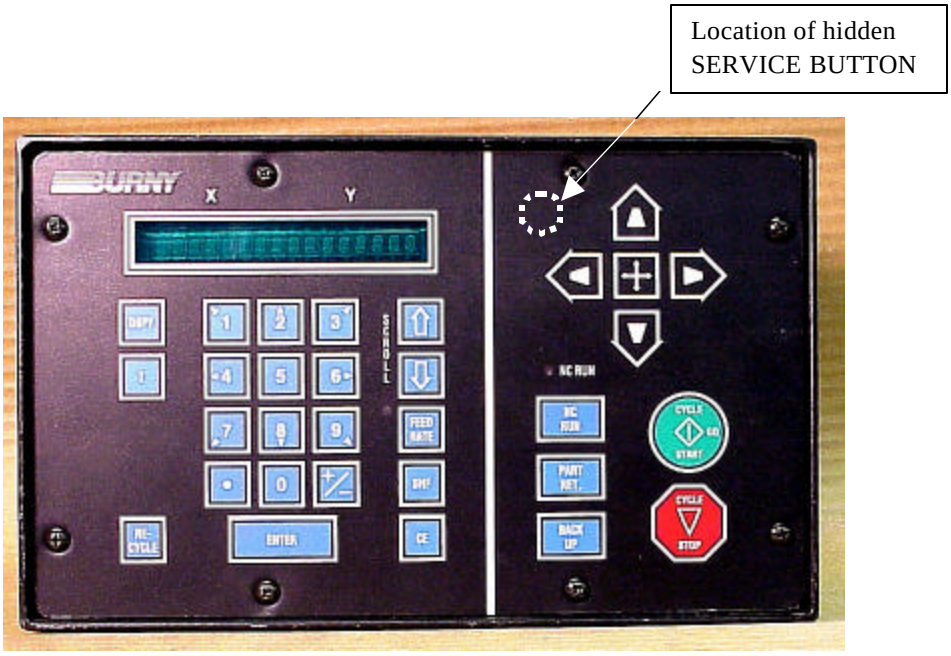


Figure 1- Typical Burny 2.5 Front Panel

Card installation:

1. Remove all sources of AC power to the machine, and lock-out the power disconnect to the machine to prevent accidental re-application of AC power during the service process.

2. Connect a grounded anti-static wrist strap to the machine frame and place it on the wrist of the installing technician.

3. Remove the screws holding the front panel of the product. For the Burny 2.5, these are the 8 screws around the keyboard panel. On the 1250 and 1400, there are 8 to 10 screws holding in the entire front hinged door. And finally, on the Burny 2.8, there are 22 screws holding the entire top cover of the cabinet—remove all but the bottom 4 screws along the lower front edge of the cabinet—just loosen the front 4 screws and lift the lid out of the slotted holes. See Figure 1.

4. Once the screws are removed, lay the front panel open so the screws holding the interface card to the processor card can be accessed.

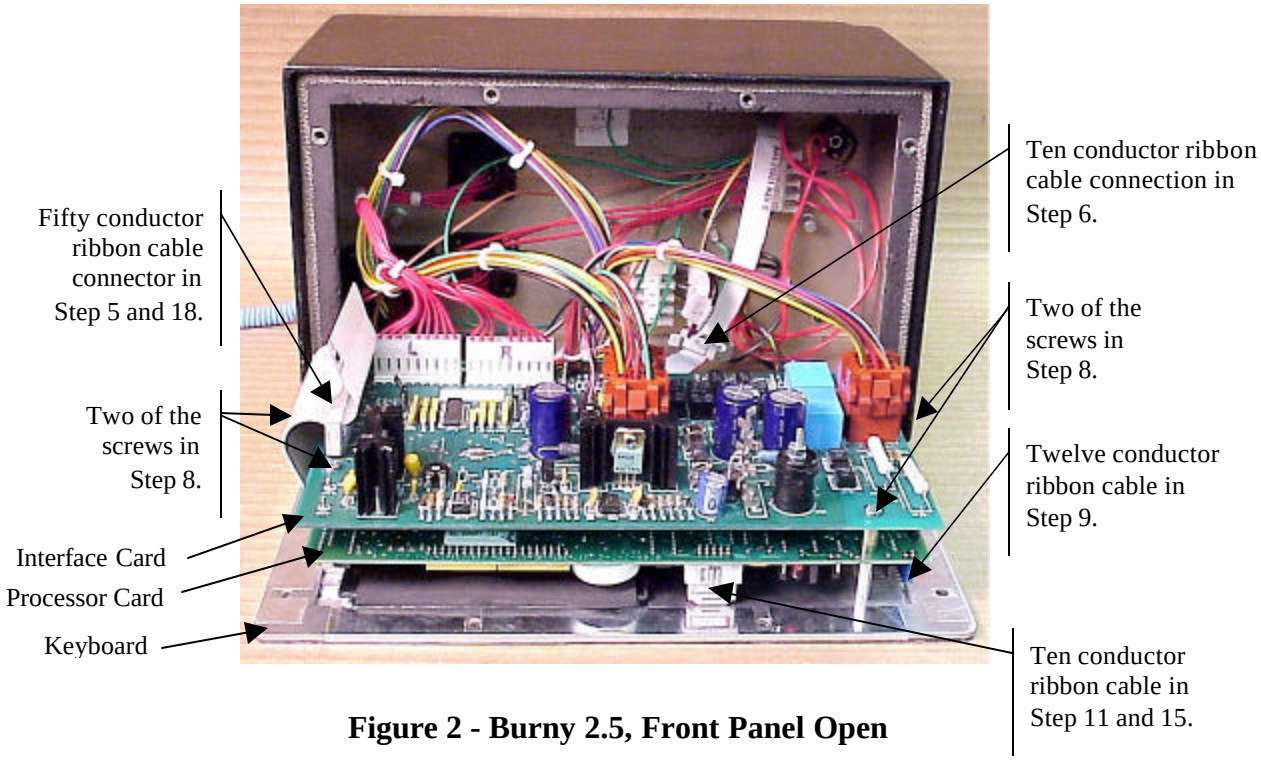


Figure 2 - Burny 2.5, Front Panel Open

5. Unplug the large 50 conductor ribbon cable that runs from the processor card to the interface card. See Figure 2.

6. Disconnect the 10 conductor ribbon cable from the processor card to the RS-232/422 modem. See Figure 2.

7. If installed, unplug the 14 conductor ribbon cable that runs from the processor card to the optional home limit switch input card used on some Burny 2.5 and 2.8 systems. See Figure 3.

8. Remove the 4 screws holding the interface card to the processor card in the system. This will make the interface and the processor card free floating so take care not to drop or stress the wires in the system during

this step. See Figure 2.

9. Lift the processor card slightly away from the keyboard panel, and unplug the 12 conductor ribbon that runs from the keyboard panel to the processor. See Figure 2.

10. Remove the old processor card from the system.

11. Remove the short 10 and/or 14 conductor ribbon cables from the old processor card—these will be re-used with the new card. See Figure 3.

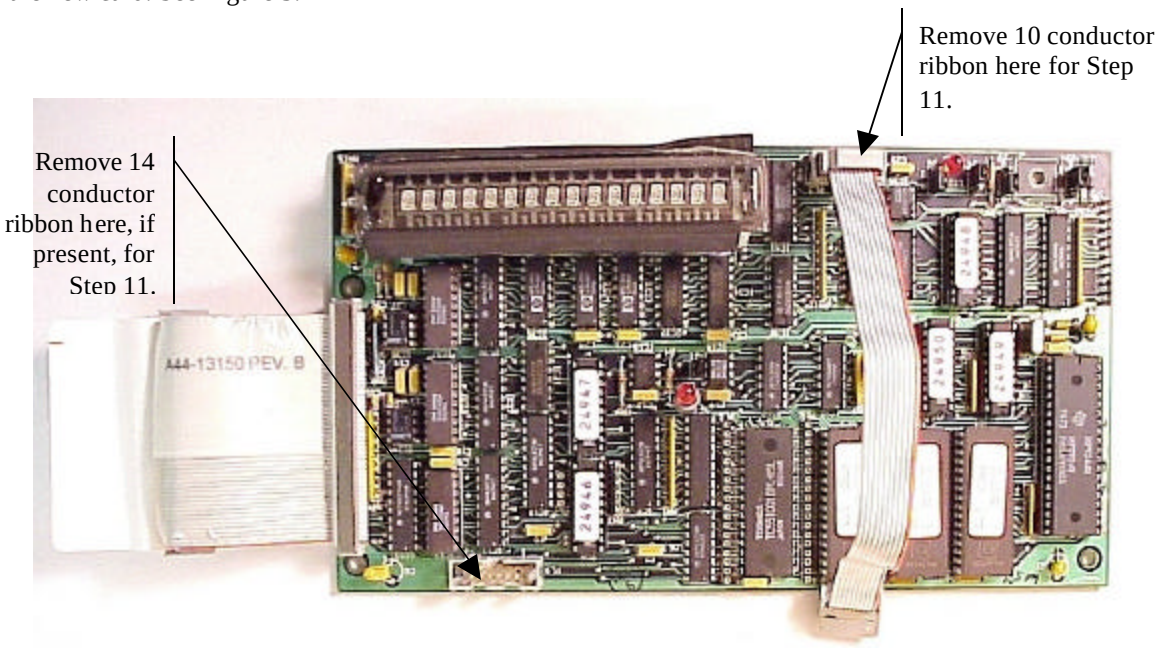


Figure 3 - Burny 2.5 Existing Processor Board

12. If a Burny 2.8 is being updated, remove the old keyboard by removing the 6 screws around the bezel on the front of the unit and discarding the old keyboard. Install the new keyboard supplied with the updated kit using the same screws and bezel as the old panel.

13. If a Burny 2.5 is being updated, discard the old keyboard. Use the new keyboard supplied with the update kit.

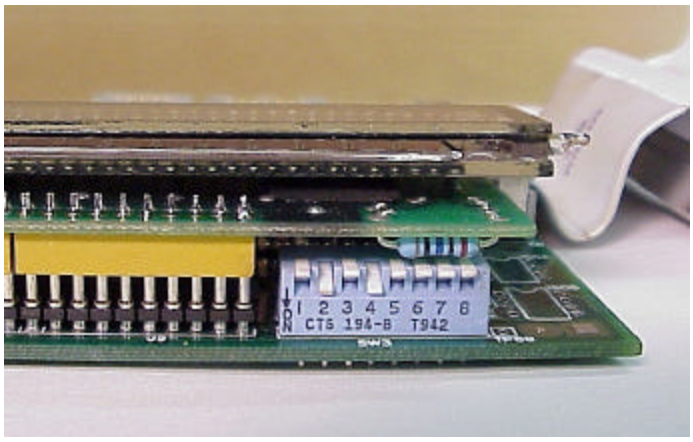


Figure 4 - DIP Switch in Step 14

14. Remove the new MO-12438 processor card from it's protective bag. See Figure 5 and 9. Set the DIP switch located on the new card under the readout as follows:

    - When using the MO-12438 card with any of the Burny 2.5 type keyboards that include the **4 DIRECTIONAL JOG ARROWS,** or with a **Burny 1250** or **Burny 1400** keyboard which also include the jog arrow buttons, the DIP switch on the MO-12438 **MUST** be set as follows:

      Position 1 -- OFF
      Position 2 -- ON
      Position 3 -- OFF
      Position 4 -- ON
      Position 5 -- OFF
      Position 6 -- OFF
      Position 7 -- OFF
      Position 8 -- OFF

      See Figure 4 -- these are the proper jumper settings when used with the new Burny 2.5 Plus front panel.

    - See APPENDIX A for details and precautions for using the MO-12438 card with older style Burny 2.5, 2.8 and private label keyboard panels.

15. Re-connect the 10 and/or 14 conductor ribbon cables to the new processor card—the connectors for these cables are located in almost the exact same location as the old card. Take care that the 10 pin cable for the serial RS-232/422 port is connected to the J4 connector on the new card. There is another 10 pin connector on the new processor card that will be used for software updates—but it will not function for the RS-232 port use. See Figure 5.

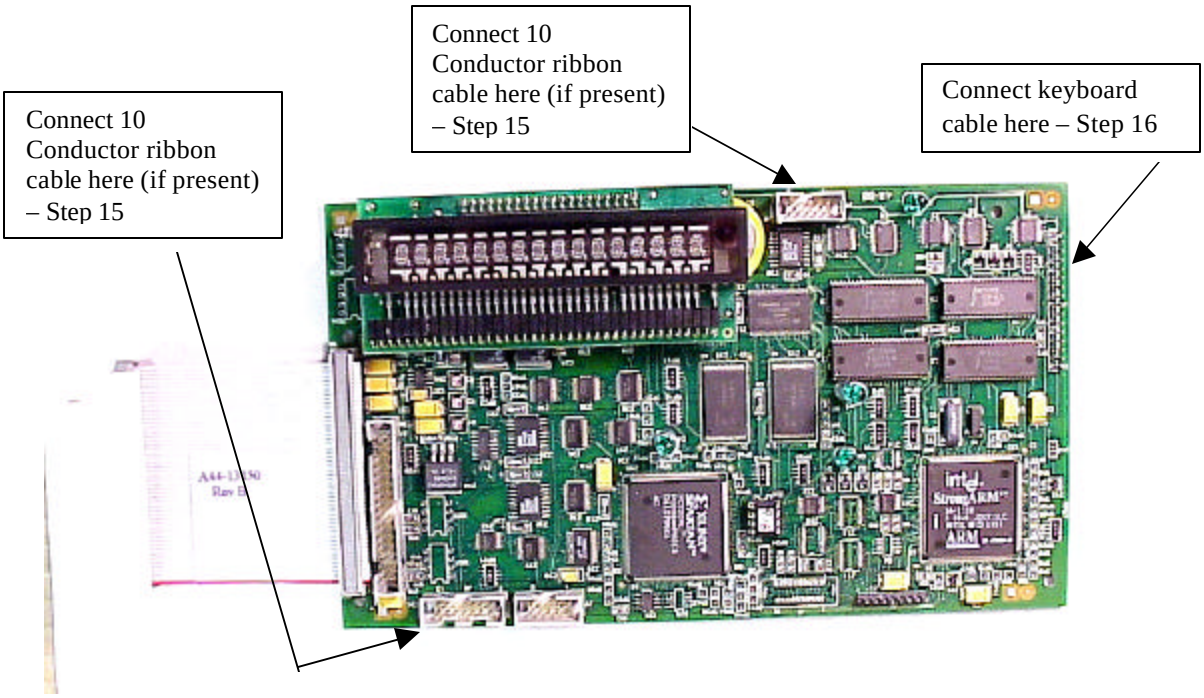


Figure 5 - Front of New Processor Board

16. Place the new MO-12438 card over the keyboard, and connect the ribbon from the keyboard to the J1 connector on the new processor card. Be sure to apply the ribbon connector starting at pin 1 of the J1 connector—the new processor card has some extra pins included in the J1 connector for future expansion—the older keyboards must be connected to the original 12 input pins. Also make sure the 10 or 14 conductor additional ribbon cables are routed under the card properly and are not pinched or interfering with the LED's or other devices.

17. Align the interface card and new processor over the keyboard standoffs, and replace the 4 screws to hold these two boards together.

18. Connect the 10, 14 and 50 conductor ribbon cables to their respective locations in the system. See Figure 2.

19. Replace the keyboard in the cabinet on 2.5 systems, close the door on the 1250/1400 or replace the 2.8's cabinet lid and replace the screws to hold in the panel or door. Make sure all screws are tight to insure a dust tight seal around the opening.

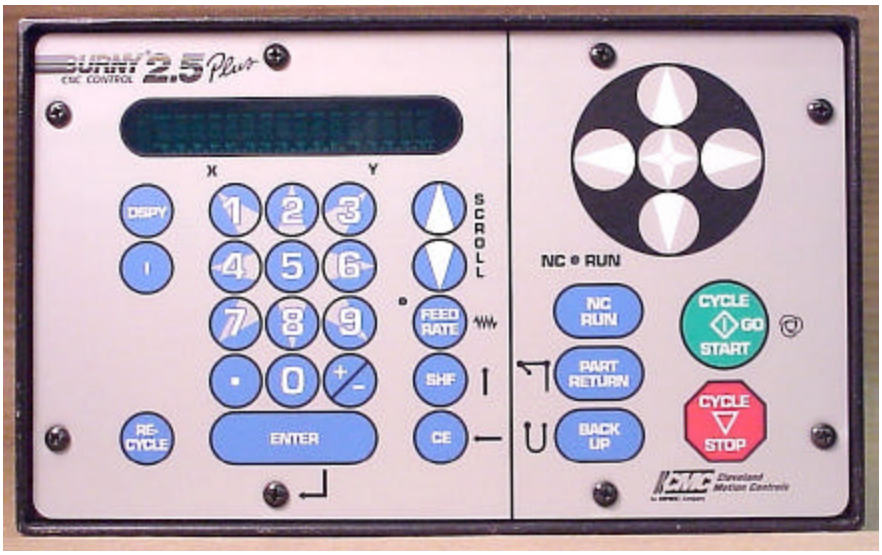


Figure 6 - Burny 2.5 *Plus* Front Panel

20. Remove the wrist strap now that the new card is installed and the cabinet is closed

21. Continue with this procedure to re-install all the data needed to make the new board function on the machine.

7. Power ON – Re-install saved data

Now that the mechanical installation of the new card is complete, the new card must be configured to run the system and act the same as the card that was removed. There will be some changes in the operation of the controls since you are updating the software to the most recent software version as a result of this card exchange. Consult the new Burny 2.5 operation manual supplied with the update kit for details on how to operate the new features.

1. Re-Apply AC power to the cutting machine and turn on the Burny system if there is a separate switch. The control should power up normally and display the familiar READY --- SELECT FUNCTION message.

2. DO NOT enable the servo drives for the system. If possible, disengage the pinion gears from the drive rack so that the machine. This is done as a precaution until it is confirmed that the parameters are working correctly in the new system.

3. Verify that the keyboard works properly. Try several operations to verify that most of the keys work correctly.

4. Press the hidden SERVICE button and select the SERV52- MEM RESET. Press ENTER and answer YES to both prompts to reset the program storage memory. After the process is done, use the DSPY80 function to display the amount of memory Used and Available. There should be almost 512K bytes available—this is the standard memory size on the MO-12438 Burny 2.5 Plus processor card.

5. Press the hidden SERVICE button and access the SERV10 parameter list. GO back to section 2.1.1 of this document and enter all the parameters in the SERV10 list. ALL PARAMETERS must be entered into the new card—do not skip any of the entries. If a value was not found in the old card, there is a suggested DEFAULT value in the table that should be entered into the new card. After the system is running, these new parameters may need to be re-adjusted to give optimal machine performance—see the new manual shipped with the update for details on the new parameter settings.

SPECIAL REQUIREMENTS FOR OLDER SYSTEMS

If the MO-12438 is being used to replace the older MO-03370, MO-4873, or MO-04875 processor cards—see APPENDIX B for information regarding the encoder scaling jumpers on these old cards, and how it affects the setup parameters

6. Refer back to Section 4 of this document where the OPTIONS from the old board were recorded. All of the features that used to be referred to as OPTIONS are now all STANDARD features in the Burny 2.5 Plus—there are no special option codes to enter. However, 2 of these old OPTION capabilities require a setting of one of the setup parameters to either ENABLE or DISABLE the feature.

COMM ENHANCE OPTION

Parameter SD51 now has a bit to control the COMM ENHANCE OPTION. This is an 8 digit parameter--for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the COMM ENHANCE option was ON with the old board, set digit D3 of the SD51 parameter to 0. (xx0xxxxx). This will cause the COMM ENHANCE to function on the new card.

- If the COMM ENHANCE option was OFF with the old board, set digit D3 of parameter SD51 to an "8" to disable the COMM ENHANCE feature on the new board— (xx8xxxxx).

KNIFE KERF OPTION

Parameter SD63 now has a bit to control the KNIFE KERF OPTION. Knife kerf is a special mode for the kerf routine that is used by the sign making industry for the special requirements of the drag knife used for cutting vinyl material, or for router cutting of plastic and aluminum for signs.

This is an 8 digit parameter-- for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the KNIFE KERF option was ON with the old board, set digit D3 of the SD63 parameter to a 1. (xx1xxxxx). This will cause the KNIFE KERF to function on the new card.

- If the KNIFE KERF option was OFF with the old board, set digit D3 of parameter SD51 to an "0" to disable the KNIFE KERF feature on the new board— (xx0xxxxx).

7. Press the hidden SERVICE button again, and access the SERV41 overlay table list. Go back to section 2.2.1 of this document and re-enter all the parameters saved from the SERV41 list in the old control.

8. Press the hidden SERVICE button again, and access the SERV42 overlay table list. Go back to section 2.3.1 of this document and re-enter all the parameters saved from the SERV42 list in the old control.

9. Press the hidden SERVICE button again, and access the SERV43 overlay table list. Go back to section 2.4.1 of this document and re-enter all the parameters saved from the SERV43 list in the old control.

10. Press the hidden SERVICE button again, and access the SERV44 overlay table list. Go back to section 2.5.1 of this document and re-enter all the parameters saved from the SERV44 list in the old control.

11. Press the hidden SERVICE button again, and access the SERV45 overlay table list. Go back to section 2.6.1 of this document and re-enter all the parameters saved from the SERV45 list in the old control.

12. Press the hidden SERVICE button and perform the SERV97 procedure to store the new parameters so they will not be lost when the power is turned off.

13. Press the hidden SERVICE button and select the SERV51-SPD CAL function—press ENTER to select the function, but DO NOT follow the prompts on the screen regarding the CYCLE START button. Instead, press the hidden SERVICE button again, and now select the SERV97 function and store the cleared speed calibration data.

14. Press the hidden SERVICE button and access the SERV78-CUSTOM AUX code conversion table. Go back to section 3.1.1 and re-enter all the data saved for the Custom AUX table from the old control. The procedure would be to press the ENTER button to get to the next AUX location, then press ENTER again to access the TVVFF entry screen. Enter the TVVFF code saved from the old control (32005) and press ENTER. You can scroll back to a previous entry to check it if desired.

15. The control should now be operational. Turn on the servo drives and test the motion of the machine. See the manual that came with this update kit for details on the new setup parameters for help in adjusting the machine's performance.

8. Appendix A – DIP Switch settings for older Burny 2.5 Front Panels

Older front panels for the Burny 2.5, as well as several of the private labeled versions did not include the 4 Directional JOG ARROWS as shown in the pictures. These panels used a sequence of pressing the II button, then used the numbered keyboard to select the jog direction.

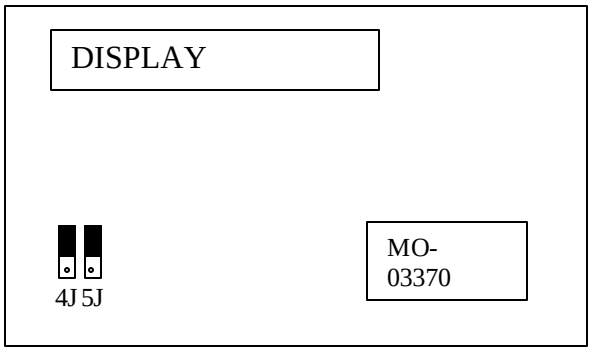
To configure the new MO-12438 board to work correctly with these older panels, the DIP switches must be set to match the configuration jumpers from the old boards.

DIP switch settings for MO-03370 processor card replacement

SW1 – ON
SW2 – OFF
SW3 – OFF
SW4 – Set to ON if Jumper 4J is set AWAY from the display.
Set to OFF if Jumper 4J is set TOWARD the display.

SW5 – Set to ON if Jumper 5J is set AWAY from the display.
Set to OFF if Jumper 5J is set TOWARD the display.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-04873 or MO-04875 processor card replacement

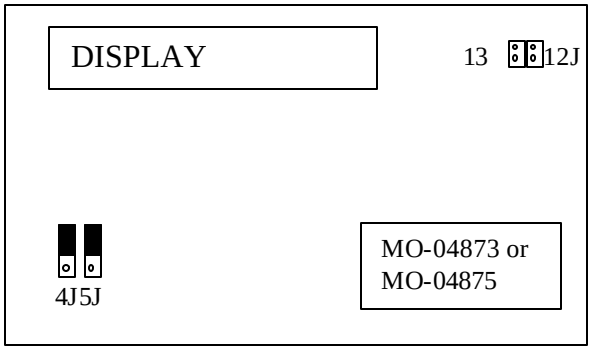
SW1 – ON
SW2 – Set to OFF if Jumper 12J is missing,
Set to ON if jumper J12 is installed

SW3 – Set to OFF if Jumper 13J is missing,
Set to ON if jumper J13 is installed

SW4 – Set to ON if Jumper 4J is set AWAY from the readout.
Set to OFF if Jumper 4J is set TOWARD the readout.

SW5 – Set to ON if Jumper 5J is set AWAY from the readout.
Set to OFF if Jumper 5J is set TOWARD the readout.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-08601 or MO-11249 processor card replacement

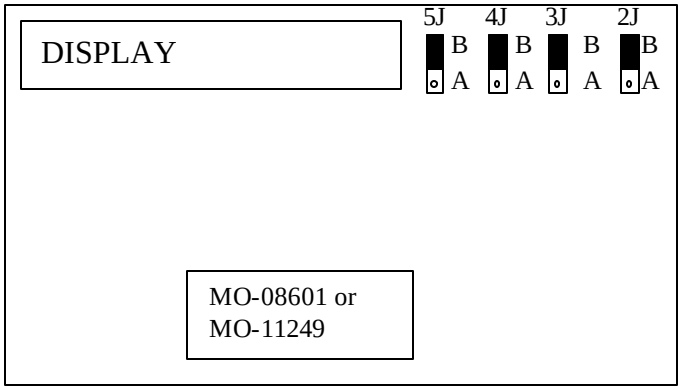
SW1 – ON
SW2– Set to OFF if Jumper J2 is set to “A”,
Set to ON if Jumper J2 is set to “B”

SW3– Set to OFF if Jumper J3 is set to “A”,
Set to ON if Jumper J3 is set to “B”

SW4– Set to OFF if Jumper J4 is set to “A”,
Set to ON if Jumper J4 is set to “B”

SW5– Set to OFF if Jumper J5 is set to “A”,
Set to ON if Jumper J5 is set to “B”

SW6, SW7, SW8 – All set to OFF



9. Appendix B – Changes to Encoder Scaling for older 2.5 updates

The older MO-03370, MO-04873 and MO-04875 processor cards included hardware jumpers J6 thru J9 on the card. These were used to tolerate faster encoder counting frequencies that could not be handled by the hardware. The newer 2.5 processor cards use faster encoder counting circuitry and eliminated these jumpers.

If one of these older boards (3370,4873,4875) are being replaced, the setting of these jumpers can affect the parameters entered into the new MO-12438 card.

If all 4 of the jumpers J6,J7,J8 and J9 are set toward the display (See Fig. 1), then the setup parameters from the old board can be directly entered into the new card.

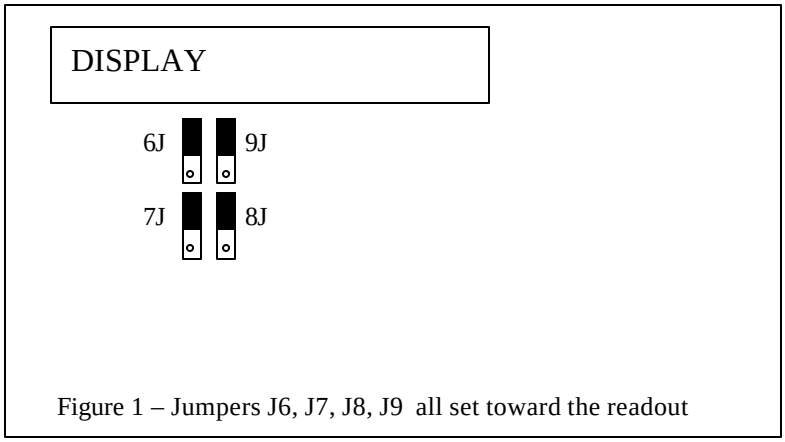


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

Some installations may be using faster encoders, particularly motor mounted encoders, and may have these jumpers set the opposite direction. If all 4 of the jumpers J6,J7, J8, J9 (Figure 2) are set away from the DISPLAY, then the value recorded for parameter SD22- ENC LINES/REV must be multiplied by 4. So for example, a system where the old card had a setting of 500 for SD22 would need to have 2000 entered into the new MO-12438 to work properly.

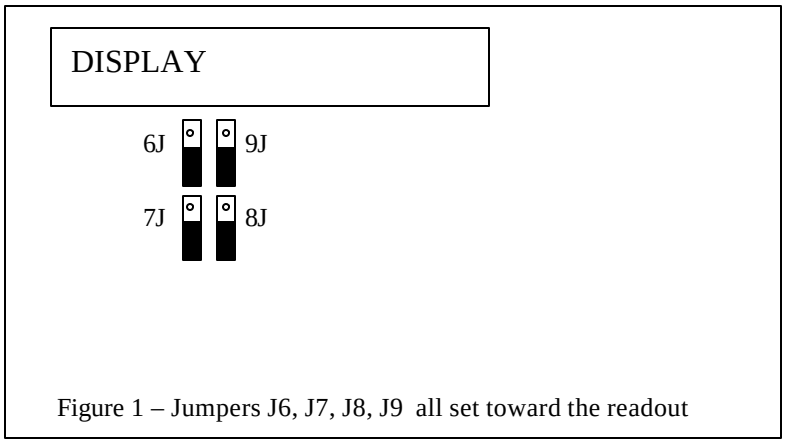


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

If the old system has jumpers J6, J7, J8, J9 set to any other random pattern, contact the factory since this will require modifying several of the system parameters. This is very uncommon.

10. Appendix C "Burny 2.5 Plus-- New features and Capabilities"

The goal of the 2.5 Plus development program was to produce a new version of the computer board in the Burny 2.5 series products that would improve the speed and system performance, without affecting the basic operation. The 2.5 Plus processor card will perform RS-232 downloads, and the Kerf calculations 80-90% faster than the older cards.

Most of the prompting, displays and operator inputs are exactly the same as the older cards—so there is little or no re-training required when the new 2.5 Plus card is substituted for an older card. However, there is the problem that the 2.5 Plus basically copies the operation of the Burny 2.5 software that was in existence at the end of 1999. If the older 2.5 card had software dating back many years (could go back as far as 1988), then there will be substantial differences in the machine's operation due to the changes and improvements that have occurred over the years of software development on the Burny 2.5 product line. This may require some additional training for the operators to become familiar with the new operation of the control, and the new capabilities available to the operator. See the new OPERATION MANUAL supplied along with this Burny 2.5 Plus product for details on all the current features of the product.

The two main areas where a difference will be noted are in the Serial I/O downloading speeds, and the Kerf processing speed.

Kerf Processing speed

The Kerf process is self contained within the Burny 2.5 Plus—there is no interaction with the outside world so the process can function at peak efficiency.

Serial I/O Downloading Speed

The Serial I/O downloading is a different matter. Since the Serial I/O communication via the RS-232/422 port connects to devices outside the Burny product, the performance of the downloading system is very dependent on the performance and setting of the external devices. For example, if the existing cutting machine had the BAUD rate set to 2400 Baud for the serial downloading speed, there will be NO increase in performance of the Serial Downloading speed with the Burny 2.5 Plus—the older card work just as well at 2400 baud as the new 2.5 Plus card. To fully take advantage of the new downloading speed capacity of the Burny 2.5 Plus card, the external system must be capable of supplying the data faster also. The following is an ESTIMATE of the speed improvement expected for various Baud rate settings of the Burny 2.5 Plus. Note that the higher baud rate settings were not even possible with the older Burny 2.5 which was normally used up to about 4800 baud.

Serial I/O Downloading Baud Rate setting	ESTIMATED speed improvement with Burny 2.5 Plus.
300 to 2400 Baud	0%-- Same speed as older card
4800 Baud	25% Less time for download
9600 Baud	60% Less time for download
19.2K Baud	80% Less time for download
28.8K Baud	80% Less time for download
38.4K Baud	75% Less time for download
57.6K to 230K Baud	60-75% Less time—note that these very high baud rates require more system overhead and are actually LESS EFFICIENT than the somewhat slower settings from 19.2K to 38.4K Baud

Serial Number and Option codes

The Burny 2.5 Plus software does not use Option codes—all possible features for the product are available as Standard capabilities with every system that ships. Similarly, there is no longer a SERIAL NUMBER imbedded into the product—the display will show " SERIAL 0" for all Burny 2.5 Plus products. The main purpose for the Serial number was to control the software lockout codes for the options—no more options means no more serial number.

The fact that all Options are now standard will cause some new menus and displays to show up on older controls where a particular option was missing before. For example, if an older Burny 2.8 did not have the STANDARD SHAPES option installed, there would not have been a menu choice for "LOAD-STANDARD SHAPE" in the select function list. When the 2.5 Plus card is installed, the operator will now see this "LOAD- STANDARD SHAPE" prompt – this should be explained to the operator ahead of time to avoid possible confusion.

The following is a list of the features that will now appear on all controls—the ones marked ** may have been missing from the older card—they are now provided as a standard capability of the new Burny 2.5 Plus software:

- RUN- PROGRAM
- LOAD- FROM STD SHAPE ** (Older card required Standard Shape option to be enabled)
- LOAD- FROM RS-232 ** (Older card required Serial I/O Option to be enabled)
- STORE- TO RS-232 ** (Older card required Serial I/O Option to be enabled)
- TEACH- PROGRAM ** (Older card required Teach Option to be enabled)
- DELETE-PROGRAM
- EDIT-PROGRAM ** (Very old cards could only access EDIT via DSPY20-)
- LOAD- FROM FLOPPY ** (Older cards required Floppy option to be enabled)
- STORE- TO FLOPPY ** (Older cards required Floppy option to be enabled)
- LOAD/RUN- RS-232 ** (Older cards required Serial I/O option to be enabled)
- LOAD/RUN-FLOPPY ** (Older cards required Floppy option to be enabled)

Some operators may complain that they have to Scroll through too many choices in this new expanded list of features to get what they want. Remember that these choices can be made with a single button push as described in the operation manual— as a reminder, the following number keys select the indicted function:

- RUN- PROGRAM -- Press the number 1 on the keypad
- LOAD- FROM STD SHAPE -- Press the number 2 on the keypad
- LOAD- FROM RS-232 -- Press the number 3 on the keypad
- STORE- TO RS-232 -- Press the number 4 on the keypad
- TEACH- PROGRAM -- Press the number 5 on the keypad
- DELETE-PROGRAM -- Press the number 6 on the keypad
- EDIT-PROGRAM -- Press the number 7 on the keypad
- LOAD- FROM FLOPPY -- Press the number +/- on the keypad
- STORE- TO FLOPPY -- Press the number . (decimal point) on the keypad
- LOAD/RUN- RS-232 -- Press the number 3, then the SHF on the keypad
- LOAD/RUN-FLOPPY -- Press the +/- key, then the SHF on the keypad

Blank

Burny 2.5 PLUS Update

Installation instructions for field upgrades using the Burny 2.5 PLUS processor card.

Also for use with MO-12685 and MO-12742 upgrade kits

ECO REVISION HISTORY

Revision	*Description*	*ECO*	*Date*
-AA	Written	---	28-July-00
-BA	Add photos, DIP Switch and parameter for old cards	CLE1716	07-Dec-00

Spec No.:	*Division:* BURNY
Author: RDM	*Rev:* **BA**
File name: AO-90177BA.doc	*Date:* **7-Dec-2000**

Cleveland Motion Controls
An IMC Company

REVISION HISTORY

Rev AA	RDM (28-July-2000) -- Written
Rev BA	JRB (7-Dec-2000) -- Added retrofit Figures and references
	RDM(7-Dec-2000) -- Add APPENDIX A,B for Dip switch settings for older front panels, and APPENDIX B for modifications needed to Encoder Scaling parameters when MO-3370 or 4873 or 4875 board was replaced.

TABLE OF CONTENTS

1. INTRODUCTION

These instructions document the steps needed to update existing Burny 2.5 controls, or any of the other Series 2 controls (1250,1400, 2.8, 2.9) with the new MO-12438 Burny 2.5 Plus processor card. The procedure assumes the installer is familiar with the Burny products and is capable of the mechanical assembly/disassembly and entry of parameters into the system.

For updates on a Burny 1250 or Burny 1400 system, the original keyboard can still be used—just the processor card is replaced as described in the following procedures.

For Burny 2.5, Burny 2.8 or Burny 2.9 systems, a special part number MO-12685 has been created to provide a new processor card with the new 2.5 Plus keyboard. This is necessary since the older Burny 2.5 keyboards do not have the proper clearance in the aluminum panel for the current readout used on the Burny 2.5 products. By ordering this MO-12685 kit, the installer is assured of having a panel that works fits the readout.

The main purpose of this particular procedure is to document all of the stored parameters, option codes, Aux code conversion tables, etc. which are configured in the existing Series 2 control BEFORE the new processor card is installed. Once the new card is operational, this stored data from the old system will be re-entered with the goal of making the new card capable of running the machine in as little time as possible.

2. PARAMETER and SYSTEM DATA RETRIEVAL

Before disassembling anything, the installer must first retrieve all the data stored in the existing Burny 2.5 system. There is no automatic way to do this with the older software, therefore the data must be manually obtained. The following pages have procedures and tables to be used to write down the parameter data, Code Conversion table data, and options enabled in the current system. Then, after the new processor card and panel are installed, these values must be manually re-entered into the new system. If this process is done correctly, and attention is paid to getting the data correct, the new system should begin operation with no further tuning required.

2.1 System Data Parameters-SERV10

With the existing system operating normally, press the hidden "SERVICE" button and access SERV10-SYS DATA. Press ENTER to display the main system parameter list. The display shows the first parameter as:

SD01-ARC ON DELAY

Press the ENTER button a second time to display the value currently set for this parameter—if the Arc On delay had been set for 3 seconds, the display would now show:

AONDLY = 3.00

Write down this 3.00 value in the following table. Press the ENTER button to access the next parameter name, and then press the ENTER button a second time to access the value—the display would have showed:

SD02-BLEEDOFF then BLEDOF= 2.00 (2 seconds used for this example)

Continue stepping through the entire list of parameters and write their values in the able provided.

IMPORTANT: Older systems may not include all the parameters shown on this list.

Older systems had less parameters than the current Burny 2.5—therefore it is important to carefully pay attention to the parameter number displayed on the screen, and match it to the table before writing the value. Any parameters that were not included in the old system will be handled during the installation portion for the new card.

2.1.1 SERV10 PARAMETERS

Parameter Number and Name	PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN	Default value to be used for older systems where a parameter was not part of the older products list.	Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system
SD01- ARC ON TIME	ARCDLY =		
SD02- BLEEDOFF	BLEDOF =		
SD03- ACCEL TIME	ACCTME =		
SD04- MAX DRV SPD	MAXSPD =		
SD06- BACKUP SPD	BCKSPD =		
SD07- CORNER SPD	CORSPD =		
SD08- MIN HLD SPD	MINHLD =		
SD09- ERR SPD MAX	ERRSPD =	20 inch/min 400 mm/min	

SD10- RUNSPD LIMIT	RUNLMT =		
SD11- TRAVERS LMT	TRVLMT =		
SD12- MIN ACCEL	MIN ACCEL =	.20 seconds	
SD14- GAIN BREAK	GAIN BREAK =	0	
SD15- ERR WRN DST	WRNDST =		
SD16- LOOP GAIN	LPGAIN =		
SD17- ARC OFF DLY	AOFDLY =	2.0 seconds	
SD18- SLWDWN DIST	SLWDST =		
SD19- DISABL DIST	DISABL =	.25 inches 6.3 mm	
SD20- X ENC DIST	XENSCL =		
SD21- Y ENC DIST	YENSCL =		
SD22- ENC LIN/REV	ENC LINES =		
SD23- X ENC DIR	X ENC DIR -		
SD24- Y ENC DIR	Y ENC DIR -		
SD25- X DRV DIR	X DRV DIR -		
SD26- Y DRV DIR	Y DRV DIR -		
SD27- PLATE SIDE	PLATE ON -		
SD28- HEIGHT RLY	CONTACT -		
SD29- SLWDWN RAD	SLWRAD =		
SD30- MIN RAD SPD	MRADSP =	30 inches/min 150 mm/min	
SD31- PLASMA TB1	PLASMA TB1 =	NO	
SD32- MIN SLW ANG	MINSLW =	10	
SD33- MAX SLW ANG	MAXSLW =	22	
SD40- X MARK OFF	XOFST1 =		
SD41- Y MARK OFF	YOFST1 =		
SD42- MARKER SPD	MRKSPD =		
SD43- MARK DELAY	MRKDLY =		
SD45- DEFLT DWELL	DFDWEL =		
SD46- MIN OFF DWL	MINOFF =		
SD47- XOFST2	XOFST2 =		

SD48- YOFST2	YOFST2=		
SD49- START DELAY	STRDLY =	1.5 seconds	
SD50- SERIAL DEFN	SERIAL DEFN =		
SD5- PRGM FORMAT	PGMFMT =		
SD52- SPECIAL EOP	EOP 1 =		
SD53- FILE EXTEN	FEXTEN =	434E4300	
SD60- OPER SYS	OPER SYS =		
SD61- SYS CONFG 1	SYSCFG1 =		
SD62- SYS CONFG 2	SYSCFG2 =		
SD63- SYS CONFG 3	SYSCFG3 =	0	
SD65- OVERLAY CFG	OVERLAY CFG =	0	
SD68- SPEED RANGE	SPEED RANGE =	4	
SD69- LA NGUAGE	LANGUAGE =	0	
SD70- KNF ROT DIA	KNFDIA =		
SD71- KNF B.P. ANG	KNF B.P. ANG =		
SD74- T2XHOM	T2XHOM =		
SD75-T2YHOM	T2YHOM =		
SD76- T3XHOM	T3XHOM =		
SD77- T3YHOM	T3YHOM =		
SD78- T4XHOM	T4XHOM =		
SD79- T4YHOM	T4YHOM =		
SD80- XOFST1	XOFST1 =		
SD81- XOFST1	YOFST1 =		
SD82- XOFST2	XOFST2 =		
SD83- XOFST2	YOFST2 =		
SD84- XOFST3	XOFST3 =		
SD85- XOFST3	YOFST3 =		
SD86- XOFST4	XOFST4 =		
SD87- XOFST4	YOFST4 =		
SD88- XOFST5	XOFST5 =		

SD89- XOFST5	YOFST5 =		
SD90- XOFST6	XOFST6 =		
SD91- XOFST6	YOFST6 =		
SD92- XOFST7	XOFST7 =		
SD93- XOFST7	YOFST7 =		
SD94- XOFST8	XOFST8 =		
SD95- XOFST8	YOFST8 =		
SD96- XHOMSW	XHOMSW =		
SD97- XHOMSW	YHOMSW =		
SDA0- XBKLSH	XBKLSH =	0	
SDA1- YBKLSH	YBKLSH =	0	
SDA2- LSH RATE	LSH RATE =		
SDD0- SYNC W-AXIS	SYNC ENABLE =	NO	
SDD1- W GAIN	W GAIN =		
SDD2- SKEW LIMT	SKWLMT =		
SDD3- W MAX SPD	WMXSPD =		
SDD4- W ENC DIR	W ENCODER =		
SDD5- W DRV DIR	W DRIVE =		
SDD6- WBKLSH	WBKLSH =		
SDD7 – W OFFSET	WOFSET =		

2.2 System Overlay Table #1 Parameters - SERV41

Burny 2.5 systems built after 1983 had the 5 sets of additional setup parameters which could be selected by programming codes within a part program to "overlay" the standard SERV10 parameter list. Access this list of values by pressing the hidden "SERVICE" button and access SERV41-TB 1 DATA. Press ENTER to display the overlay table #1 list. Note this list is much shorter than the SERV10 list. Again, carefully step down through the list and write the values in the following list:

2.2.1 SERV41 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
1-03- ACCEL TIME	ACCTME =		
1-07- CORNER SPD	CORSPD =		
1-10- RUNSPD LIMIT	RUNLMT =		
1-12- MIN ACCEL	MIN ACCEL =		
1-14- GAIN BREAK	GAIN BREAK =		
1-16- LOOP GAIN	LPGAIN =		
1-18- SLWDWN DIST	SLWDST =		
1-19- DISABL DIST	DISABL =		
1-29- SLWDWN RAD	SLWRAD =		
1-30- MIN RAD SPD	MRADSP =		
1-32- MIN SLW ANG	MINSLW =		
1-33- MAX SLW ANG	MAXSLW =		
1-45- DEFLT DWELL	DFDWEL =		
1-46- MIN OFF DWL	MINOFF =		
1-49- START DELAY	STRDLY =		

2.3 System Overlay Table #2 Parameters - SERV42

Continue with this process to access the data in Overlay Table #2 by pressing the hidden "SERVICE" button and access SERV42-TB 2 DATA. Press ENTER to display the overlay table #2 list.

2.3.1 SERV42 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
2-03- ACCEL TIME	ACCTME =		
2-07- CORNER SPD	CORSPD =		
2-10- RUNSPD LIMIT	RUNLMT =		
2-12- MIN ACCEL	MIN ACCEL =		
2-14- GAIN BREAK	GAIN BREAK =		
2-16- LOOP GAIN	LPGAIN =		
2-18- SLWDWN DIST	SLWDST =		
2-19- DISABL DIST	DISABL =		
2-29- SLWDWN RAD	SLWRAD =		
2-30- MIN RAD SPD	MRADSP =		
2-32- MIN SLW ANG	MINSLW =		
2-33- MAX SLW ANG	MAXSLW =		
2-45- DEFLT DWELL	DFDWEL =		
2-46- MIN OFF DWL	MINOFF =		
2-49- START DELAY	STRDLY =		

2.4 System Overlay Table #3 Parameters - SERV43

Continue with this process to access the data in Overlay Table #3 by pressing the hidden "SERVICE" button and access SERV43-TB 3 DATA. Press ENTER to display the overlay table #3 list.

2.4.1 SERV43 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
3-03- ACCEL TIME	ACCTME =		
3-07- CORNER SPD	CORSPD =		
3-10- RUNSPD LIMIT	RUNLMT =		
3-12- MIN ACCEL	MIN ACCEL =		
3-14- GAIN BREAK	GAIN BREAK =		
3-16- LOOP GAIN	LPGAIN =		
3-18- SLWDWN DIST	SLWDST =		
3-19- DISABL DIST	DISABL =		
3-29- SLWDWN RAD	SLWRAD =		
3-30- MIN RAD SPD	MRADSP =		
3-32- MIN SLW ANG	MINSLW =		
3-33- MAX SLW ANG	MAXSLW =		
3-45- DEFLT DWELL	DFDWEL =		
3-46- MIN OFF DWL	MINOFF =		
3-49- START DELAY	STRDLY =		

2.5 System Overlay Table #4 Parameters - SERV44

Continue with this process to access the data in Overlay Table #4 by pressing the hidden "SERVICE" button and access SERV44-TB 4 DATA. Press ENTER to display the overlay table #4 list.

2.5.1 SERV44 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
4-03- ACCEL TIME	ACCTME =		
4-07- CORNER SPD	CORSPD =		
4-10- RUNSPD LIMIT	RUNLMT =		
4-12- MIN ACCEL	MIN ACCEL =		
4-14- GAIN BREAK	GAIN BREAK =		
4-16- LOOP GAIN	LPGAIN =		
4-18- SLWDWN DIST	SLWDST =		
4-19- DISABL DIST	DISABL =		
4-29- SLWDWN RAD	SLWRAD =		
4-30- MIN RAD SPD	MRADSP =		
4-32- MIN SLW ANG	MINSLW =		
4-33- MAX SLW ANG	MAXSLW =		
4-45- DEFLT DWELL	DFDWEL =		
4-46- MIN OFF DWL	MINOFF =		
4-49- START DELAY	STRDLY =		

2.6 System Overlay Table #5 Parameters - SERV45

Continue with this process to access the data in Overlay Table #5 by pressing the hidden "SERVICE" button and access SERV45-TB 5 DATA. Press ENTER to display the overlay table #5 list.

2.6.1 SERV54 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
5-03- ACCEL TIME	ACCTME =		
5-07- CORNER SPD	CORSPD =		
5-10- RUNSPD LIMIT	RUNLMT =		
5-12- MIN ACCEL	MIN ACCEL =		
5-14- GAIN BREAK	GAIN BREAK =		
5-16- LOOP GAIN	LPGAIN =		
5-18- SLWDWN DIST	SLWDST =		
5-19- DISABL DIST	DISABL =		
5-29- SLWDWN RAD	SLWRAD =		
5-30- MIN RAD SPD	MRADSP =		
5-32- MIN SLW ANG	MINSLW =		
5-33- MAX SLW ANG	MAXSLW =		
5-45- DEFLT DWELL	DFDWEL =		
5-46- MIN OFF DWL	MINOFF =		
5-49- START DELAY	STRDLY =		

3. Retrieving Custom Aux Table Data – SERV78

The Burny 2.5 has the ability to convert the M and G or ESSI auxiliary functions in a part program into the functional codes needed by the Burny to cut the part. The data for making this conversion is contained in a list accessed by pressing the hidden "SERVICE" button, and then selecting the SERV78-CUSTOM AUX utility. Press ENTER to access the first entry in the list. There are 2 display formats used with this list—when the table is first accessed, the display will be in the "Table position" mode which shows which of the 50 possible entries is being displayed, and the current setting for that table location:

AUX01-M20-CUTOFF

This indicates that the first table location "AUX01" contains the data to convert an M20 code from a word address program into an internal Cut Off function—turn the oxygen or plasma off at the end of a cut.

Pressing ENTER at this point changes the display to show the TVVFF code for the AUX01 entry—the display will appear as:

32005-M20-CUTOFF

The 32005 is the TVVFF code:

T -- a single digit that defines the type of code begin converted (1-ESSI, 2-G code, 3-M code)

VV – a 2 or 3 digit value (up to 127) that defines the numeric value for the code (20 in this example)

FF – a 2 digit code defining the internal function assigned to the code (see Burny 2.5 manual for the list)

It is NOT necessary to understand what all these codes do to install the Burny 2.5 Plus processor card--- the important thing is to get them written down in the following chart so they can be re-entered in the new control.

The procedure would be to step through the list for each of the AUX entries and write down the data displayed for the block and the TVVFF displays.

While this list contains a maximum of 50 entries, the number of AUX table entries is usually much less. The end of the list is indicated by a display of a location being AVAILABLE. This means that no data has been entered for this table entry—the Burny will not search the table past this AVAILABLE location therefore any data following the first AVAILABLE location is not needed—it would not affect the controls operation in any way.

Begin stepping through the list and write down the data in the following chart:

3.1.1 AUX CODE TABLE DATA

Table location display: Example: AUX01 – M20 – CUT OFF	TVVFF display Example:32005 – M20 – CUT OFF
AUX01 -- --	-- --
AUX02 -- --	-- --
AUX03 -- --	-- --

AUX04	--	--	--	--
AUX05	--	--	--	--
AUX06	--	--	--	--
AUX07	--	--	--	--
AUX08	--	--	--	--
AUX09	--	--	--	--
AUX10	--	--	--	--
AUX11	--	--	--	--
AUX12	--	--	--	--
AUX13	--	--	--	--
AUX14	--	--	--	--
AUX15	--	--	--	--
AUX16	--	--	--	--
AUX17	--	--	--	--
AUX18	--	--		
AUX19	--	--		
AUX20	--	--		
AUX21	--	--		
AUX22	--	--		
AUX23	--	--		
AUX24	--	--		
AUX25	--	--		
AUX26	--	--		
AUX27	--	--		
AUX28	--	--		
AUX29	--	--		
AUX30	--	--		
AUX31	--	--		
AUX32	--	--	--	--
AUX33	--	--	--	--
AUX34	--	--	--	--
AUX35	--	--	--	--
AUX36	--	--	--	--

AUX37	--	--	--	--	
AUX38	--	--			
AUX39	--	--			
AUX40	--	--			
AUX41	--	--			
AUX42	--	--			
AUX43	--	--			
AUX44	--	--			
AUX45	--	--			
AUX46	--	--			
AUX47	--	--			
AUX48	--	--			
AUX49	--	--			
AUX50	--	--			

4. OPTION CODES

All of the Burny 2.5 and related Series 2 controls have various software options that are enabled by special "Lockout" codes based on the serial number of the control. While the new Burny 2.5 Plus card has all "options" now loaded as standard features, the Option Settings for the old board must be documented to determine some of the parameter settings on the new board.

There are two ways that this is done, depending on the age of the software in the existing control.

4.1 Option code display on very old systems.

Very old systems only display the options as a coded text string during power-up. The control will turn on and go through it's normal tests, and then display a text string as:

OPTN- C2D4007000

Each digit in this display references a particular option.

Turn the power Off, and back On to the control, and wait for this string to appear—then record the value in the following spaces (it may take several cycles of power Off/On to get the entire string written down correctly).

OPTN										

4.2 Option code display on newer Burny 2.5 (Series 2) systems

Controls with more recent software will have a display function called DSPY80 which tells the ON/OFF status of each option directly on the screen. Press the DSPY button and select DSPY80. When the ENTER button is pressed, the display will first show a sequence of values showing the serial number, hardware type and how much memory is used. Press the ENTER button during this sequence and the display will change to show:

OPTIONS

KERF --- ON or KERF --- OFF

Pressing enter will step down through this list and show the status of each option as ON or OFF. Record these values in the following chart for later use. Some of these options may not appear in the list since they are now considered "standard"—the chart has locations for them to make the recording process easier

4.2.1 Option ON/OFF status

OPTION NAME	ON/OFF
KERF	
SCALE	
ROTATE	
MIRROR	
PLATE ALIGN	
SERIAL COMM	
COMM ENHANCE	
CAD LINK	
PLATE MARKER	
STD. SHAPES	
TEACH	
KNIFE KERF	
CUSTOM AUX.	
LANGUAGE or individual language such as SPANISH, FRENCH, GERMAN, etc.	
FLOPPY DRIVE	
PRG. FDRT/KRF (programmable feedrate and kerf)	

5. BACKUP PART PROGRAMS

The final section of data that must be transferred from the existing Burny 2.5 to the new Burny 2.5 PLUS card are the stored part programs in the control. Part programs could have been created by either loading a Standard Shape, Template Teach, Downloading a program from the serial port or a Floppy, or creating a program using the Editor.

When the old processor card is removed from the system, these programs will be lost unless they are backed up to some external device. Some customers will already have all of their programs stored on the host computer, so there is no need to backup the data from the Burny 2.5. However, other customers will have programs created by template teach, that are only stored in the Burny 2.5's memory—these programs should be backed up if possible.

This can be done in two ways.

If the system is equipped with a serial port, and the external computing device can accept program uploads, use the STORE function in the Burny 2.5 to store to the RS-232 port and send all the internal programs up to the host computer.

If the system is equipped with an internal or external Floppy Disk drive, use the STORE function in the Burny 2.5 and store the programs to a series of floppy disks so they can be reloaded into the new card.

6. Power Off—Swap processor cards

Now that all the data from the existing Burny 2.5 processor card has either been stored to some external device, or recorded on this document on the lists provided, the old card can be removed, and the new card installed.

IMPORTANT: Remove all sources of AC power to the machine before performing any service work. The main power disconnect should be turned off and Locked in the OFF state to prevent someone from accidentally turning the power back on during the service operation.

WARNING: Proper handling procedures must be followed when installing the new MO-12438 Burny 2.5PLUS processor card. This card contains many high speed, high density electronic devices that can be damaged by STATIC ELECTRICITY caused by improper handling. Before removing the card from it's protective bag, the installing technician MUST use a grounded anti-static wrist strap connected to the machine chassis. All sources of STATIC ELECTRICITY should be removed from the area (any styrofoam, plastic packing material, bubble wrap, plastic paper sleeve protectors, etc). Once the board is removed from it's protective bag, it should be installed directly into the Burny system—do not lay it on a table or other surface that may not be grounded.

**The existing Burny 2.5 processor card should be placed back into the same protective anti-static bag after it is removed from the system. **

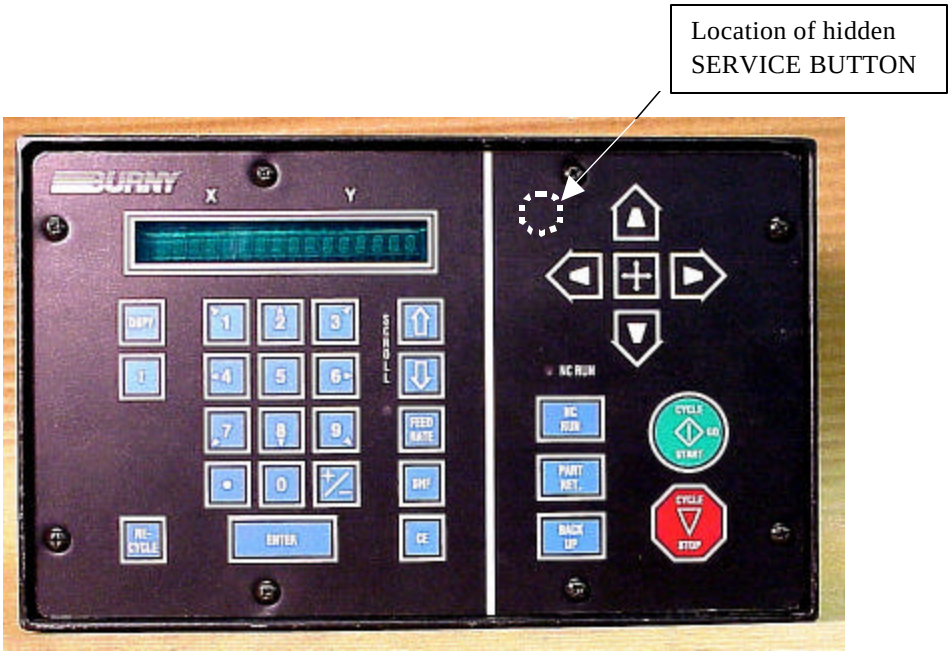


Figure 1- Typical Burny 2.5 Front Panel

Card installation:

1. Remove all sources of AC power to the machine, and lock-out the power disconnect to the machine to prevent accidental re-application of AC power during the service process.

2. Connect a grounded anti-static wrist strap to the machine frame and place it on the wrist of the installing technician.

3. Remove the screws holding the front panel of the product. For the Burny 2.5, these are the 8 screws around the keyboard panel. On the 1250 and 1400, there are 8 to 10 screws holding in the entire front hinged door. And finally, on the Burny 2.8, there are 22 screws holding the entire top cover of the cabinet—remove all but the bottom 4 screws along the lower front edge of the cabinet—just loosen the front 4 screws and lift the lid out of the slotted holes. See Figure 1.

4. Once the screws are removed, lay the front panel open so the screws holding the interface card to the processor card can be accessed.

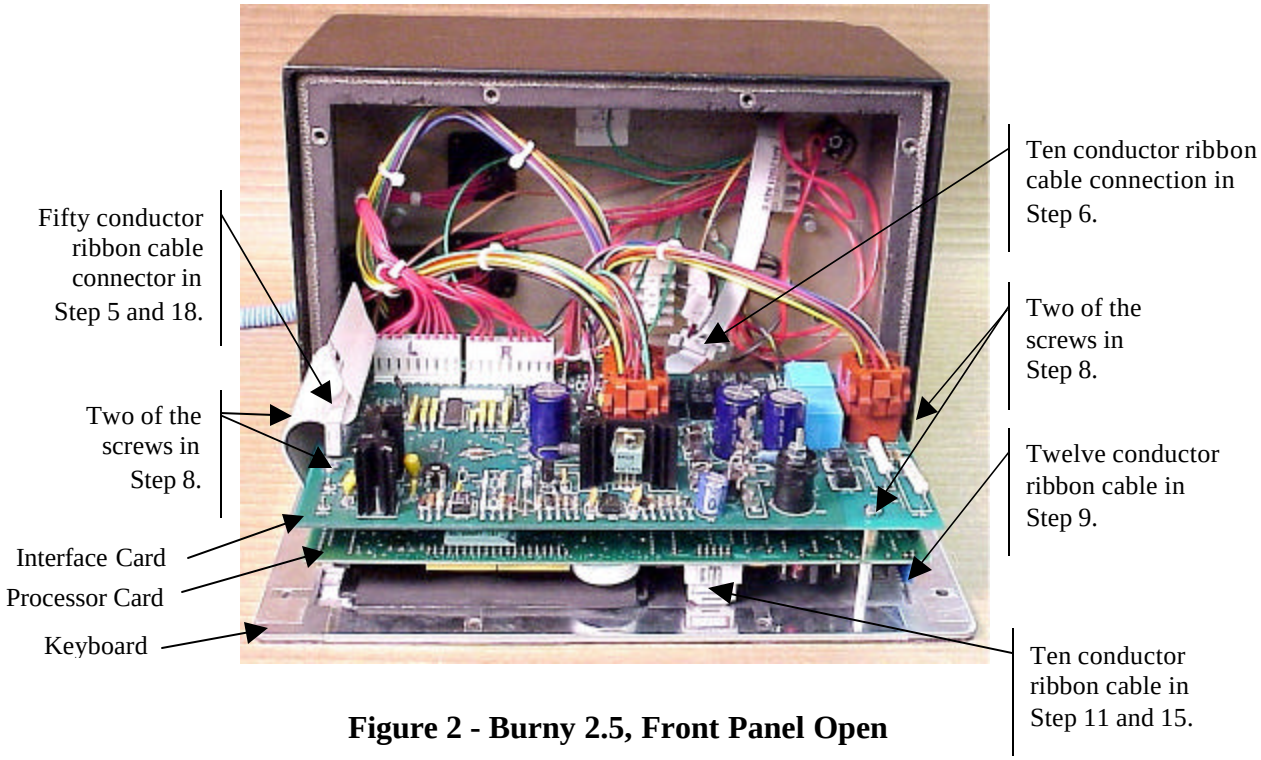


Figure 2 - Burny 2.5, Front Panel Open

5. Unplug the large 50 conductor ribbon cable that runs from the processor card to the interface card. See Figure 2.

6. Disconnect the 10 conductor ribbon cable from the processor card to the RS-232/422 modem. See Figure 2.

7. If installed, unplug the 14 conductor ribbon cable that runs from the processor card to the optional home limit switch input card used on some Burny 2.5 and 2.8 systems. See Figure 3.

8. Remove the 4 screws holding the interface card to the processor card in the system. This will make the interface and the processor card free floating so take care not to drop or stress the wires in the system during

this step. See Figure 2.

9. Lift the processor card slightly away from the keyboard panel, and unplug the 12 conductor ribbon that runs from the keyboard panel to the processor. See Figure 2.

10. Remove the old processor card from the system.

11. Remove the short 10 and/or 14 conductor ribbon cables from the old processor card—these will be re-used with the new card. See Figure 3.

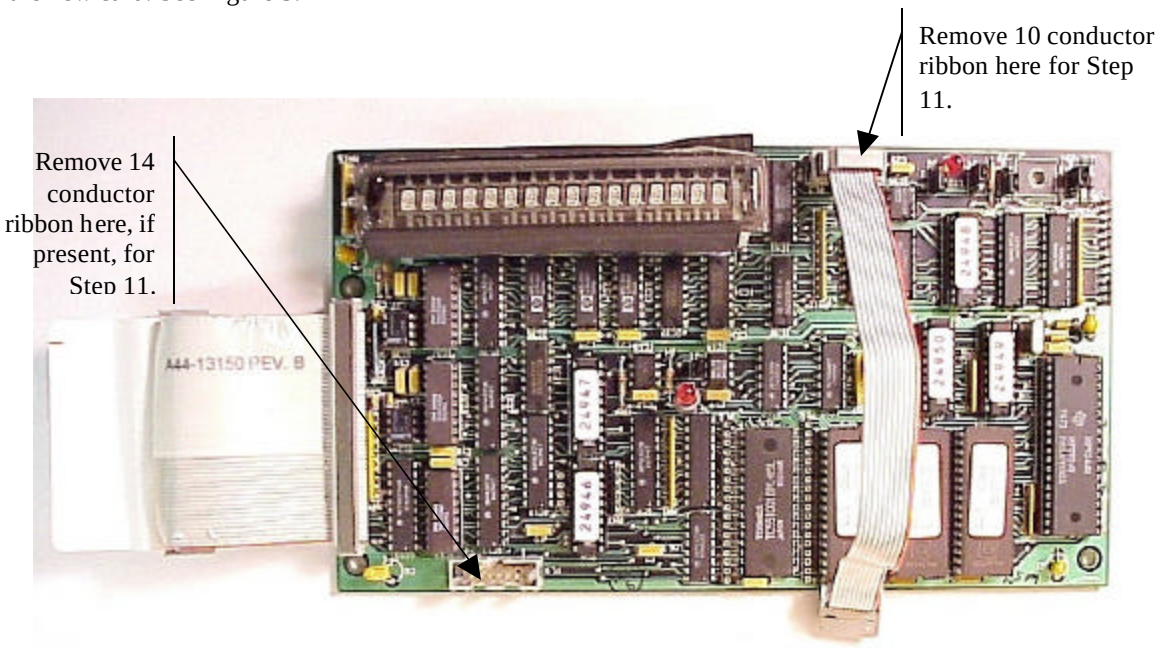


Figure 3 - Burny 2.5 Existing Processor Board

12. If a Burny 2.8 is being updated, remove the old keyboard by removing the 6 screws around the bezel on the front of the unit and discarding the old keyboard. Install the new keyboard supplied with the updated kit using the same screws and bezel as the old panel.

13. If a Burny 2.5 is being updated, discard the old keyboard. Use the new keyboard supplied with the update kit.

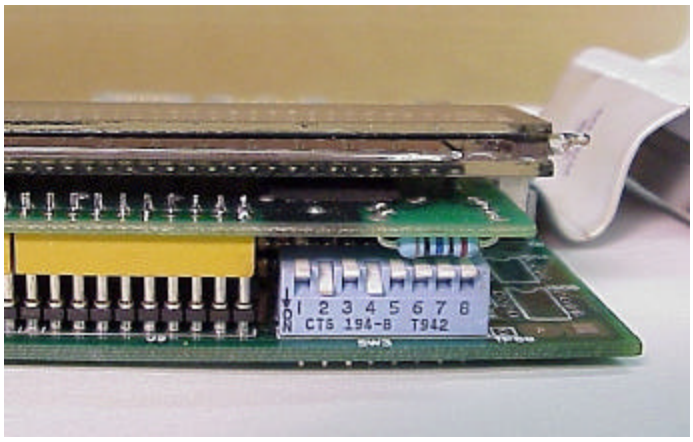


Figure 4 - DIP Switch in Step 14

14. Remove the new MO-12438 processor card from it's protective bag. See Figure 5 and 9. Set the DIP switch located on the new card under the readout as follows:

    - When using the MO-12438 card with any of the Burny 2.5 type keyboards that include the **4 DIRECTIONAL JOG ARROWS,** or with a **Burny 1250** or **Burny 1400** keyboard which also include the jog arrow buttons, the DIP switch on the MO-12438 **MUST** be set as follows:

      Position 1 -- OFF
      Position 2 -- ON
      Position 3 -- OFF
      Position 4 -- ON
      Position 5 -- OFF
      Position 6 -- OFF
      Position 7 -- OFF
      Position 8 -- OFF

      See Figure 4 -- these are the proper jumper settings when used with the new Burny 2.5 Plus front panel.

    - See APPENDIX A for details and precautions for using the MO-12438 card with older style Burny 2.5, 2.8 and private label keyboard panels.

15. Re-connect the 10 and/or 14 conductor ribbon cables to the new processor card—the connectors for these cables are located in almost the exact same location as the old card. Take care that the 10 pin cable for the serial RS-232/422 port is connected to the J4 connector on the new card. There is another 10 pin connector on the new processor card that will be used for software updates—but it will not function for the RS-232 port use. See Figure 5.

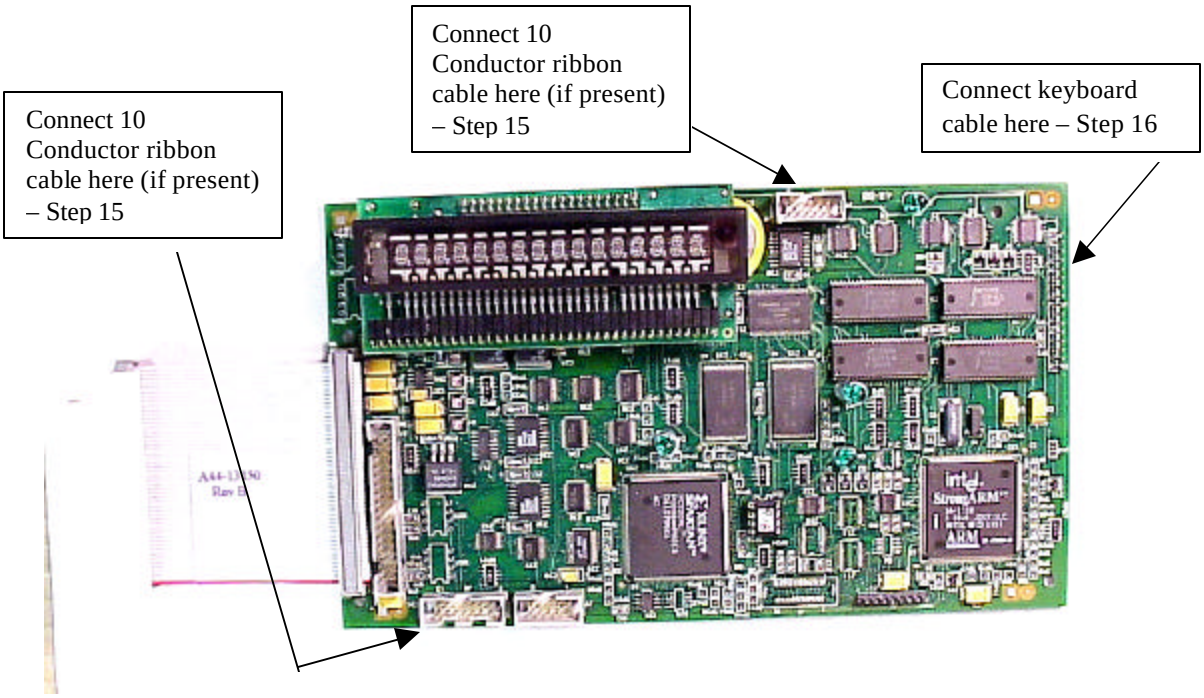


Figure 5 - Front of New Processor Board

16. Place the new MO-12438 card over the keyboard, and connect the ribbon from the keyboard to the J1 connector on the new processor card. Be sure to apply the ribbon connector starting at pin 1 of the J1 connector—the new processor card has some extra pins included in the J1 connector for future expansion—the older keyboards must be connected to the original 12 input pins. Also make sure the 10 or 14 conductor additional ribbon cables are routed under the card properly and are not pinched or interfering with the LED's or other devices.

17. Align the interface card and new processor over the keyboard standoffs, and replace the 4 screws to hold these two boards together.

18. Connect the 10, 14 and 50 conductor ribbon cables to their respective locations in the system. See Figure 2.

19. Replace the keyboard in the cabinet on 2.5 systems, close the door on the 1250/1400 or replace the 2.8's cabinet lid and replace the screws to hold in the panel or door. Make sure all screws are tight to insure a dust tight seal around the opening.

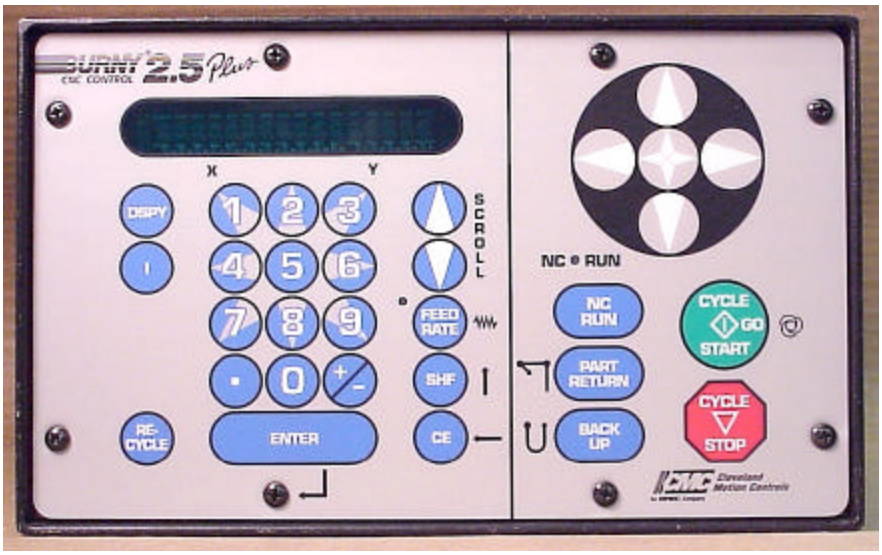


Figure 6 - Burny 2.5 *Plus* Front Panel

20. Remove the wrist strap now that the new card is installed and the cabinet is closed

21. Continue with this procedure to re-install all the data needed to make the new board function on the machine.

7. Power ON – Re-install saved data

Now that the mechanical installation of the new card is complete, the new card must be configured to run the system and act the same as the card that was removed. There will be some changes in the operation of the controls since you are updating the software to the most recent software version as a result of this card exchange. Consult the new Burny 2.5 operation manual supplied with the update kit for details on how to operate the new features.

1. Re-Apply AC power to the cutting machine and turn on the Burny system if there is a separate switch. The control should power up normally and display the familiar READY --- SELECT FUNCTION message.

2. DO NOT enable the servo drives for the system. If possible, disengage the pinion gears from the drive rack so that the machine. This is done as a precaution until it is confirmed that the parameters are working correctly in the new system.

3. Verify that the keyboard works properly. Try several operations to verify that most of the keys work correctly.

4. Press the hidden SERVICE button and select the SERV52- MEM RESET. Press ENTER and answer YES to both prompts to reset the program storage memory. After the process is done, use the DSPY80 function to display the amount of memory Used and Available. There should be almost 512K bytes available—this is the standard memory size on the MO-12438 Burny 2.5 Plus processor card.

5. Press the hidden SERVICE button and access the SERV10 parameter list. GO back to section 2.1.1 of this document and enter all the parameters in the SERV10 list. ALL PARAMETERS must be entered into the new card—do not skip any of the entries. If a value was not found in the old card, there is a suggested DEFAULT value in the table that should be entered into the new card. After the system is running, these new parameters may need to be re-adjusted to give optimal machine performance—see the new manual shipped with the update for details on the new parameter settings.

SPECIAL REQUIREMENTS FOR OLDER SYSTEMS

If the MO-12438 is being used to replace the older MO-03370, MO-4873, or MO-04875 processor cards—see APPENDIX B for information regarding the encoder scaling jumpers on these old cards, and how it affects the setup parameters

6. Refer back to Section 4 of this document where the OPTIONS from the old board were recorded. All of the features that used to be referred to as OPTIONS are now all STANDARD features in the Burny 2.5 Plus—there are no special option codes to enter. However, 2 of these old OPTION capabilities require a setting of one of the setup parameters to either ENABLE or DISABLE the feature.

COMM ENHANCE OPTION

Parameter SD51 now has a bit to control the COMM ENHANCE OPTION. This is an 8 digit parameter--for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the COMM ENHANCE option was ON with the old board, set digit D3 of the SD51 parameter to 0. (xx0xxxxx). This will cause the COMM ENHANCE to function on the new card.

- If the COMM ENHANCE option was OFF with the old board, set digit D3 of parameter SD51 to an "8" to disable the COMM ENHANCE feature on the new board— (xx8xxxxx).

KNIFE KERF OPTION

Parameter SD63 now has a bit to control the KNIFE KERF OPTION. Knife kerf is a special mode for the kerf routine that is used by the sign making industry for the special requirements of the drag knife used for cutting vinyl material, or for router cutting of plastic and aluminum for signs.

This is an 8 digit parameter-- for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the KNIFE KERF option was ON with the old board, set digit D3 of the SD63 parameter to a 1. (xx1xxxxx). This will cause the KNIFE KERF to function on the new card.

- If the KNIFE KERF option was OFF with the old board, set digit D3 of parameter SD51 to an "0" to disable the KNIFE KERF feature on the new board— (xx0xxxxx).

7. Press the hidden SERVICE button again, and access the SERV41 overlay table list. Go back to section 2.2.1 of this document and re-enter all the parameters saved from the SERV41 list in the old control.

8. Press the hidden SERVICE button again, and access the SERV42 overlay table list. Go back to section 2.3.1 of this document and re-enter all the parameters saved from the SERV42 list in the old control.

9. Press the hidden SERVICE button again, and access the SERV43 overlay table list. Go back to section 2.4.1 of this document and re-enter all the parameters saved from the SERV43 list in the old control.

10. Press the hidden SERVICE button again, and access the SERV44 overlay table list. Go back to section 2.5.1 of this document and re-enter all the parameters saved from the SERV44 list in the old control.

11. Press the hidden SERVICE button again, and access the SERV45 overlay table list. Go back to section 2.6.1 of this document and re-enter all the parameters saved from the SERV45 list in the old control.

12. Press the hidden SERVICE button and perform the SERV97 procedure to store the new parameters so they will not be lost when the power is turned off.

13. Press the hidden SERVICE button and select the SERV51-SPD CAL function—press ENTER to select the function, but DO NOT follow the prompts on the screen regarding the CYCLE START button. Instead, press the hidden SERVICE button again, and now select the SERV97 function and store the cleared speed calibration data.

14. Press the hidden SERVICE button and access the SERV78-CUSTOM AUX code conversion table. Go back to section 3.1.1 and re-enter all the data saved for the Custom AUX table from the old control. The procedure would be to press the ENTER button to get to the next AUX location, then press ENTER again to access the TVVFF entry screen. Enter the TVVFF code saved from the old control (32005) and press ENTER. You can scroll back to a previous entry to check it if desired.

15. The control should now be operational. Turn on the servo drives and test the motion of the machine. See the manual that came with this update kit for details on the new setup parameters for help in adjusting the machine's performance.

8. Appendix A – DIP Switch settings for older Burny 2.5 Front Panels

Older front panels for the Burny 2.5, as well as several of the private labeled versions did not include the 4 Directional JOG ARROWS as shown in the pictures. These panels used a sequence of pressing the II button, then used the numbered keyboard to select the jog direction.

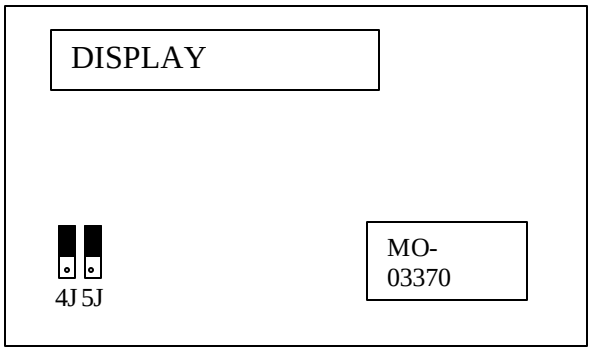
To configure the new MO-12438 board to work correctly with these older panels, the DIP switches must be set to match the configuration jumpers from the old boards.

DIP switch settings for MO-03370 processor card replacement

SW1 – ON
SW2 – OFF
SW3 – OFF
SW4 – Set to ON if Jumper 4J is set AWAY from the display.
Set to OFF if Jumper 4J is set TOWARD the display.

SW5 – Set to ON if Jumper 5J is set AWAY from the display.
Set to OFF if Jumper 5J is set TOWARD the display.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-04873 or MO-04875 processor card replacement

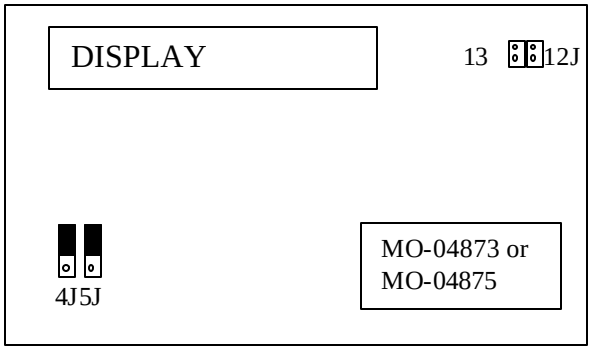
SW1 – ON
SW2 – Set to OFF if Jumper 12J is missing,
Set to ON if jumper J12 is installed

SW3 – Set to OFF if Jumper 13J is missing,
Set to ON if jumper J13 is installed

SW4 – Set to ON if Jumper 4J is set AWAY from the readout.
Set to OFF if Jumper 4J is set TOWARD the readout.

SW5 – Set to ON if Jumper 5J is set AWAY from the readout.
Set to OFF if Jumper 5J is set TOWARD the readout.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-08601 or MO-11249 processor card replacement

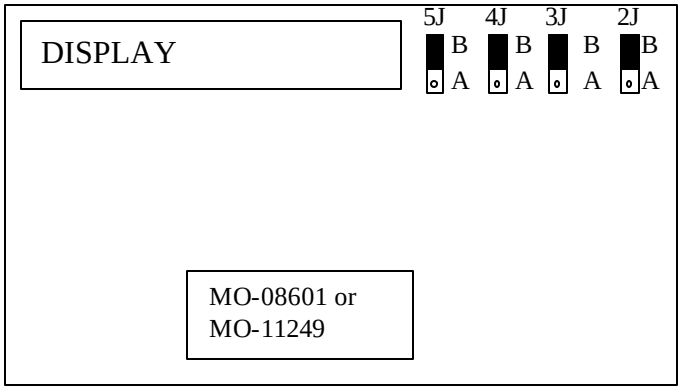
SW1 – ON
SW2– Set to OFF if Jumper J2 is set to “A”,
Set to ON if Jumper J2 is set to “B”

SW3– Set to OFF if Jumper J3 is set to “A”,
Set to ON if Jumper J3 is set to “B”

SW4– Set to OFF if Jumper J4 is set to “A”,
Set to ON if Jumper J4 is set to “B”

SW5– Set to OFF if Jumper J5 is set to “A”,
Set to ON if Jumper J5 is set to “B”

SW6, SW7, SW8 – All set to OFF



9. Appendix B – Changes to Encoder Scaling for older 2.5 updates

The older MO-03370, MO-04873 and MO-04875 processor cards included hardware jumpers J6 thru J9 on the card. These were used to tolerate faster encoder counting frequencies that could not be handled by the hardware. The newer 2.5 processor cards use faster encoder counting circuitry and eliminated these jumpers.

If one of these older boards (3370,4873,4875) are being replaced, the setting of these jumpers can affect the parameters entered into the new MO-12438 card.

If all 4 of the jumpers J6,J7,J8 and J9 are set toward the display (See Fig. 1), then the setup parameters from the old board can be directly entered into the new card.

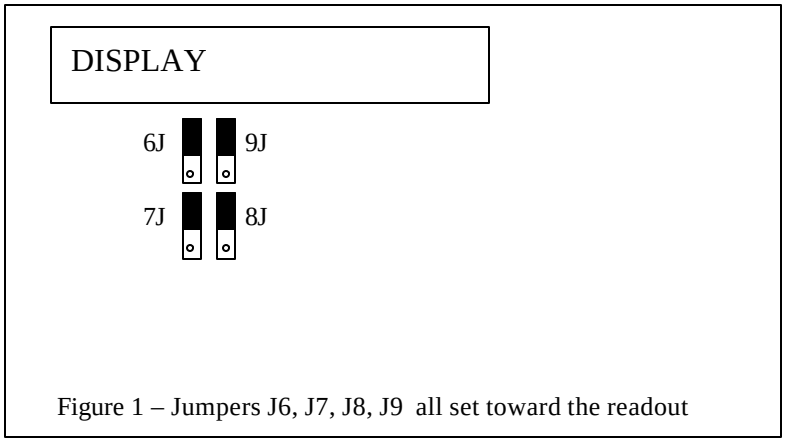


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

Some installations may be using faster encoders, particularly motor mounted encoders, and may have these jumpers set the opposite direction. If all 4 of the jumpers J6,J7, J8, J9 (Figure 2) are set away from the DISPLAY, then the value recorded for parameter SD22- ENC LINES/REV must be multiplied by 4. So for example, a system where the old card had a setting of 500 for SD22 would need to have 2000 entered into the new MO-12438 to work properly.

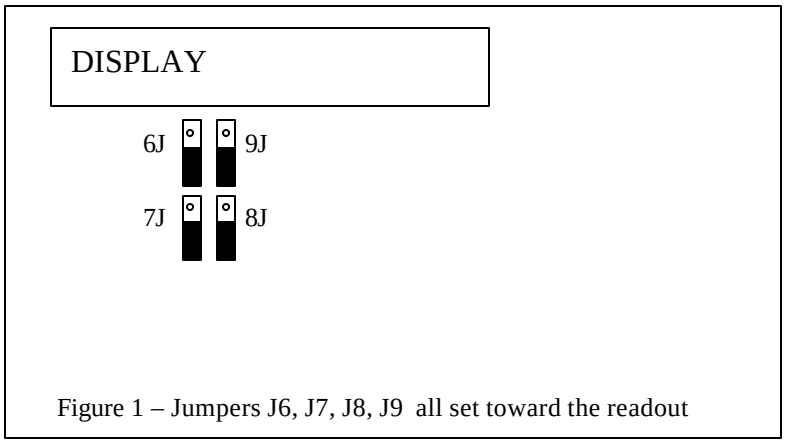


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

If the old system has jumpers J6, J7, J8, J9 set to any other random pattern, contact the factory since this will require modifying several of the system parameters. This is very uncommon.

10. Appendix C "Burny 2.5 Plus-- New features and Capabilities"

The goal of the 2.5 Plus development program was to produce a new version of the computer board in the Burny 2.5 series products that would improve the speed and system performance, without affecting the basic operation. The 2.5 Plus processor card will perform RS-232 downloads, and the Kerf calculations 80-90% faster than the older cards.

Most of the prompting, displays and operator inputs are exactly the same as the older cards—so there is little or no re-training required when the new 2.5 Plus card is substituted for an older card. However, there is the problem that the 2.5 Plus basically copies the operation of the Burny 2.5 software that was in existence at the end of 1999. If the older 2.5 card had software dating back many years (could go back as far as 1988), then there will be substantial differences in the machine's operation due to the changes and improvements that have occurred over the years of software development on the Burny 2.5 product line. This may require some additional training for the operators to become familiar with the new operation of the control, and the new capabilities available to the operator. See the new OPERATION MANUAL supplied along with this Burny 2.5 Plus product for details on all the current features of the product.

The two main areas where a difference will be noted are in the Serial I/O downloading speeds, and the Kerf processing speed.

Kerf Processing speed

The Kerf process is self contained within the Burny 2.5 Plus—there is no interaction with the outside world so the process can function at peak efficiency.

Serial I/O Downloading Speed

The Serial I/O downloading is a different matter. Since the Serial I/O communication via the RS-232/422 port connects to devices outside the Burny product, the performance of the downloading system is very dependent on the performance and setting of the external devices. For example, if the existing cutting machine had the BAUD rate set to 2400 Baud for the serial downloading speed, there will be NO increase in performance of the Serial Downloading speed with the Burny 2.5 Plus—the older card work just as well at 2400 baud as the new 2.5 Plus card. To fully take advantage of the new downloading speed capacity of the Burny 2.5 Plus card, the external system must be capable of supplying the data faster also. The following is an ESTIMATE of the speed improvement expected for various Baud rate settings of the Burny 2.5 Plus. Note that the higher baud rate settings were not even possible with the older Burny 2.5 which was normally used up to about 4800 baud.

Serial I/O Downloading Baud Rate setting	ESTIMATED speed improvement with Burny 2.5 Plus.
300 to 2400 Baud	0%-- Same speed as older card
4800 Baud	25% Less time for download
9600 Baud	60% Less time for download
19.2K Baud	80% Less time for download
28.8K Baud	80% Less time for download
38.4K Baud	75% Less time for download
57.6K to 230K Baud	60-75% Less time—note that these very high baud rates require more system overhead and are actually LESS EFFICIENT than the somewhat slower settings from 19.2K to 38.4K Baud

Serial Number and Option codes

The Burny 2.5 Plus software does not use Option codes—all possible features for the product are available as Standard capabilities with every system that ships. Similarly, there is no longer a SERIAL NUMBER imbedded into the product—the display will show " SERIAL 0" for all Burny 2.5 Plus products. The main purpose for the Serial number was to control the software lockout codes for the options—no more options means no more serial number.

The fact that all Options are now standard will cause some new menus and displays to show up on older controls where a particular option was missing before. For example, if an older Burny 2.8 did not have the STANDARD SHAPES option installed, there would not have been a menu choice for "LOAD-STANDARD SHAPE" in the select function list. When the 2.5 Plus card is installed, the operator will now see this "LOAD- STANDARD SHAPE" prompt – this should be explained to the operator ahead of time to avoid possible confusion.

The following is a list of the features that will now appear on all controls—the ones marked ** may have been missing from the older card—they are now provided as a standard capability of the new Burny 2.5 Plus software:

- RUN- PROGRAM
- LOAD- FROM STD SHAPE ** (Older card required Standard Shape option to be enabled)
- LOAD- FROM RS-232 ** (Older card required Serial I/O Option to be enabled)
- STORE- TO RS-232 ** (Older card required Serial I/O Option to be enabled)
- TEACH- PROGRAM ** (Older card required Teach Option to be enabled)
- DELETE-PROGRAM
- EDIT-PROGRAM ** (Very old cards could only access EDIT via DSPY20-)
- LOAD- FROM FLOPPY ** (Older cards required Floppy option to be enabled)
- STORE- TO FLOPPY ** (Older cards required Floppy option to be enabled)
- LOAD/RUN- RS-232 ** (Older cards required Serial I/O option to be enabled)
- LOAD/RUN-FLOPPY ** (Older cards required Floppy option to be enabled)

Some operators may complain that they have to Scroll through too many choices in this new expanded list of features to get what they want. Remember that these choices can be made with a single button push as described in the operation manual— as a reminder, the following number keys select the indicted function:

- RUN- PROGRAM -- Press the number 1 on the keypad
- LOAD- FROM STD SHAPE -- Press the number 2 on the keypad
- LOAD- FROM RS-232 -- Press the number 3 on the keypad
- STORE- TO RS-232 -- Press the number 4 on the keypad
- TEACH- PROGRAM -- Press the number 5 on the keypad
- DELETE-PROGRAM -- Press the number 6 on the keypad
- EDIT-PROGRAM -- Press the number 7 on the keypad
- LOAD- FROM FLOPPY -- Press the number +/- on the keypad
- STORE- TO FLOPPY -- Press the number . (decimal point) on the keypad
- LOAD/RUN- RS-232 -- Press the number 3, then the SHF on the keypad
- LOAD/RUN-FLOPPY -- Press the +/- key, then the SHF on the keypad

Blank

Burny 2.5 PLUS Update

Installation instructions for field upgrades using the Burny 2.5 PLUS processor card.

Also for use with MO-12685 and MO-12742 upgrade kits

ECO REVISION HISTORY

Revision	*Description*	*ECO*	*Date*
-AA	Written	---	28-July-00
-BA	Add photos, DIP Switch and parameter for old cards	CLE1716	07-Dec-00

Spec No.:	*Division:* BURNY
Author: RDM	*Rev:* **BA**
File name: AO-90177BA.doc	*Date:* **7-Dec-2000**

Cleveland Motion Controls
An IMC Company

REVISION HISTORY

Rev AA	RDM (28-July-2000) -- Written
Rev BA	JRB (7-Dec-2000) -- Added retrofit Figures and references
	RDM(7-Dec-2000) -- Add APPENDIX A,B for Dip switch settings for older front panels, and APPENDIX B for modifications needed to Encoder Scaling parameters when MO-3370 or 4873 or 4875 board was replaced.

TABLE OF CONTENTS

1. INTRODUCTION

These instructions document the steps needed to update existing Burny 2.5 controls, or any of the other Series 2 controls (1250,1400, 2.8, 2.9) with the new MO-12438 Burny 2.5 Plus processor card. The procedure assumes the installer is familiar with the Burny products and is capable of the mechanical assembly/disassembly and entry of parameters into the system.

For updates on a Burny 1250 or Burny 1400 system, the original keyboard can still be used—just the processor card is replaced as described in the following procedures.

For Burny 2.5, Burny 2.8 or Burny 2.9 systems, a special part number MO-12685 has been created to provide a new processor card with the new 2.5 Plus keyboard. This is necessary since the older Burny 2.5 keyboards do not have the proper clearance in the aluminum panel for the current readout used on the Burny 2.5 products. By ordering this MO-12685 kit, the installer is assured of having a panel that works fits the readout.

The main purpose of this particular procedure is to document all of the stored parameters, option codes, Aux code conversion tables, etc. which are configured in the existing Series 2 control BEFORE the new processor card is installed. Once the new card is operational, this stored data from the old system will be re-entered with the goal of making the new card capable of running the machine in as little time as possible.

2. PARAMETER and SYSTEM DATA RETRIEVAL

Before disassembling anything, the installer must first retrieve all the data stored in the existing Burny 2.5 system. There is no automatic way to do this with the older software, therefore the data must be manually obtained. The following pages have procedures and tables to be used to write down the parameter data, Code Conversion table data, and options enabled in the current system. Then, after the new processor card and panel are installed, these values must be manually re-entered into the new system. If this process is done correctly, and attention is paid to getting the data correct, the new system should begin operation with no further tuning required.

2.1 System Data Parameters-SERV10

With the existing system operating normally, press the hidden "SERVICE" button and access SERV10-SYS DATA. Press ENTER to display the main system parameter list. The display shows the first parameter as:

SD01-ARC ON DELAY

Press the ENTER button a second time to display the value currently set for this parameter—if the Arc On delay had been set for 3 seconds, the display would now show:

AONDLY = 3.00

Write down this 3.00 value in the following table. Press the ENTER button to access the next parameter name, and then press the ENTER button a second time to access the value—the display would have showed:

SD02-BLEEDOFF then BLEDOF= 2.00 (2 seconds used for this example)

Continue stepping through the entire list of parameters and write their values in the able provided.

IMPORTANT: Older systems may not include all the parameters shown on this list.

Older systems had less parameters than the current Burny 2.5—therefore it is important to carefully pay attention to the parameter number displayed on the screen, and match it to the table before writing the value. Any parameters that were not included in the old system will be handled during the installation portion for the new card.

2.1.1 SERV10 PARAMETERS

Parameter Number and Name	PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN	Default value to be used for older systems where a parameter was not part of the older products list.	Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system
SD01- ARC ON TIME	ARCDLY =		
SD02- BLEEDOFF	BLEDOF =		
SD03- ACCEL TIME	ACCTME =		
SD04- MAX DRV SPD	MAXSPD =		
SD06- BACKUP SPD	BCKSPD =		
SD07- CORNER SPD	CORSPD =		
SD08- MIN HLD SPD	MINHLD =		
SD09- ERR SPD MAX	ERRSPD =	20 inch/min 400 mm/min	

SD10- RUNSPD LIMIT	RUNLMT =		
SD11- TRAVERS LMT	TRVLMT =		
SD12- MIN ACCEL	MIN ACCEL =	.20 seconds	
SD14- GAIN BREAK	GAIN BREAK =	0	
SD15- ERR WRN DST	WRNDST =		
SD16- LOOP GAIN	LPGAIN =		
SD17- ARC OFF DLY	AOFDLY =	2.0 seconds	
SD18- SLWDWN DIST	SLWDST =		
SD19- DISABL DIST	DISABL =	.25 inches 6.3 mm	
SD20- X ENC DIST	XENSCL =		
SD21- Y ENC DIST	YENSCL =		
SD22- ENC LIN/REV	ENC LINES =		
SD23- X ENC DIR	X ENC DIR -		
SD24- Y ENC DIR	Y ENC DIR -		
SD25- X DRV DIR	X DRV DIR -		
SD26- Y DRV DIR	Y DRV DIR -		
SD27- PLATE SIDE	PLATE ON -		
SD28- HEIGHT RLY	CONTACT -		
SD29- SLWDWN RAD	SLWRAD =		
SD30- MIN RAD SPD	MRADSP =	30 inches/min 150 mm/min	
SD31- PLASMA TB1	PLASMA TB1 =	NO	
SD32- MIN SLW ANG	MINSLW =	10	
SD33- MAX SLW ANG	MAXSLW =	22	
SD40- X MARK OFF	XOFST1 =		
SD41- Y MARK OFF	YOFST1 =		
SD42- MARKER SPD	MRKSPD =		
SD43- MARK DELAY	MRKDLY =		
SD45- DEFLT DWELL	DFDWEL =		
SD46- MIN OFF DWL	MINOFF =		
SD47- XOFST2	XOFST2 =		

SD48- YOFST2	YOFST2=		
SD49- START DELAY	STRDLY =	1.5 seconds	
SD50- SERIAL DEFN	SERIAL DEFN =		
SD5- PRGM FORMAT	PGMFMT =		
SD52- SPECIAL EOP	EOP 1 =		
SD53- FILE EXTEN	FEXTEN =	434E4300	
SD60- OPER SYS	OPER SYS =		
SD61- SYS CONFG 1	SYSCFG1 =		
SD62- SYS CONFG 2	SYSCFG2 =		
SD63- SYS CONFG 3	SYSCFG3 =	0	
SD65- OVERLAY CFG	OVERLAY CFG =	0	
SD68- SPEED RANGE	SPEED RANGE =	4	
SD69- LA NGUAGE	LANGUAGE =	0	
SD70- KNF ROT DIA	KNFDIA =		
SD71- KNF B.P. ANG	KNF B.P. ANG =		
SD74- T2XHOM	T2XHOM =		
SD75-T2YHOM	T2YHOM =		
SD76- T3XHOM	T3XHOM =		
SD77- T3YHOM	T3YHOM =		
SD78- T4XHOM	T4XHOM =		
SD79- T4YHOM	T4YHOM =		
SD80- XOFST1	XOFST1 =		
SD81- XOFST1	YOFST1 =		
SD82- XOFST2	XOFST2 =		
SD83- XOFST2	YOFST2 =		
SD84- XOFST3	XOFST3 =		
SD85- XOFST3	YOFST3 =		
SD86- XOFST4	XOFST4 =		
SD87- XOFST4	YOFST4 =		
SD88- XOFST5	XOFST5 =		

SD89- XOFST5	YOFST5 =		
SD90- XOFST6	XOFST6 =		
SD91- XOFST6	YOFST6 =		
SD92- XOFST7	XOFST7 =		
SD93- XOFST7	YOFST7 =		
SD94- XOFST8	XOFST8 =		
SD95- XOFST8	YOFST8 =		
SD96- XHOMSW	XHOMSW =		
SD97- XHOMSW	YHOMSW =		
SDA0- XBKLSH	XBKLSH =	0	
SDA1- YBKLSH	YBKLSH =	0	
SDA2- LSH RATE	LSH RATE =		
SDD0- SYNC W-AXIS	SYNC ENABLE =	NO	
SDD1- W GAIN	W GAIN =		
SDD2- SKEW LIMT	SKWLMT =		
SDD3- W MAX SPD	WMXSPD =		
SDD4- W ENC DIR	W ENCODER =		
SDD5- W DRV DIR	W DRIVE =		
SDD6- WBKLSH	WBKLSH =		
SDD7 – W OFFSET	WOFSET =		

2.2 System Overlay Table #1 Parameters - SERV41

Burny 2.5 systems built after 1983 had the 5 sets of additional setup parameters which could be selected by programming codes within a part program to "overlay" the standard SERV10 parameter list. Access this list of values by pressing the hidden "SERVICE" button and access SERV41-TB 1 DATA. Press ENTER to display the overlay table #1 list. Note this list is much shorter than the SERV10 list. Again, carefully step down through the list and write the values in the following list:

2.2.1 SERV41 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
1-03- ACCEL TIME	ACCTME =		
1-07- CORNER SPD	CORSPD =		
1-10- RUNSPD LIMIT	RUNLMT =		
1-12- MIN ACCEL	MIN ACCEL =		
1-14- GAIN BREAK	GAIN BREAK =		
1-16- LOOP GAIN	LPGAIN =		
1-18- SLWDWN DIST	SLWDST =		
1-19- DISABL DIST	DISABL =		
1-29- SLWDWN RAD	SLWRAD =		
1-30- MIN RAD SPD	MRADSP =		
1-32- MIN SLW ANG	MINSLW =		
1-33- MAX SLW ANG	MAXSLW =		
1-45- DEFLT DWELL	DFDWEL =		
1-46- MIN OFF DWL	MINOFF =		
1-49- START DELAY	STRDLY =		

2.3 System Overlay Table #2 Parameters - SERV42

Continue with this process to access the data in Overlay Table #2 by pressing the hidden "SERVICE" button and access SERV42-TB 2 DATA. Press ENTER to display the overlay table #2 list.

2.3.1 SERV42 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
2-03- ACCEL TIME	ACCTME =		
2-07- CORNER SPD	CORSPD =		
2-10- RUNSPD LIMIT	RUNLMT =		
2-12- MIN ACCEL	MIN ACCEL =		
2-14- GAIN BREAK	GAIN BREAK =		
2-16- LOOP GAIN	LPGAIN =		
2-18- SLWDWN DIST	SLWDST =		
2-19- DISABL DIST	DISABL =		
2-29- SLWDWN RAD	SLWRAD =		
2-30- MIN RAD SPD	MRADSP =		
2-32- MIN SLW ANG	MINSLW =		
2-33- MAX SLW ANG	MAXSLW =		
2-45- DEFLT DWELL	DFDWEL =		
2-46- MIN OFF DWL	MINOFF =		
2-49- START DELAY	STRDLY =		

2.4 System Overlay Table #3 Parameters - SERV43

Continue with this process to access the data in Overlay Table #3 by pressing the hidden "SERVICE" button and access SERV43-TB 3 DATA. Press ENTER to display the overlay table #3 list.

2.4.1 SERV43 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
3-03- ACCEL TIME	ACCTME =		
3-07- CORNER SPD	CORSPD =		
3-10- RUNSPD LIMIT	RUNLMT =		
3-12- MIN ACCEL	MIN ACCEL =		
3-14- GAIN BREAK	GAIN BREAK =		
3-16- LOOP GAIN	LPGAIN =		
3-18- SLWDWN DIST	SLWDST =		
3-19- DISABL DIST	DISABL =		
3-29- SLWDWN RAD	SLWRAD =		
3-30- MIN RAD SPD	MRADSP =		
3-32- MIN SLW ANG	MINSLW =		
3-33- MAX SLW ANG	MAXSLW =		
3-45- DEFLT DWELL	DFDWEL =		
3-46- MIN OFF DWL	MINOFF =		
3-49- START DELAY	STRDLY =		

2.5 System Overlay Table #4 Parameters - SERV44

Continue with this process to access the data in Overlay Table #4 by pressing the hidden "SERVICE" button and access SERV44-TB 4 DATA. Press ENTER to display the overlay table #4 list.

2.5.1 SERV44 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
4-03- ACCEL TIME	ACCTME =		
4-07- CORNER SPD	CORSPD =		
4-10- RUNSPD LIMIT	RUNLMT =		
4-12- MIN ACCEL	MIN ACCEL =		
4-14- GAIN BREAK	GAIN BREAK =		
4-16- LOOP GAIN	LPGAIN =		
4-18- SLWDWN DIST	SLWDST =		
4-19- DISABL DIST	DISABL =		
4-29- SLWDWN RAD	SLWRAD =		
4-30- MIN RAD SPD	MRADSP =		
4-32- MIN SLW ANG	MINSLW =		
4-33- MAX SLW ANG	MAXSLW =		
4-45- DEFLT DWELL	DFDWEL =		
4-46- MIN OFF DWL	MINOFF =		
4-49- START DELAY	STRDLY =		

2.6 System Overlay Table #5 Parameters - SERV45

Continue with this process to access the data in Overlay Table #5 by pressing the hidden "SERVICE" button and access SERV45-TB 5 DATA. Press ENTER to display the overlay table #5 list.

2.6.1 SERV54 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
5-03- ACCEL TIME	ACCTME =		
5-07- CORNER SPD	CORSPD =		
5-10- RUNSPD LIMIT	RUNLMT =		
5-12- MIN ACCEL	MIN ACCEL =		
5-14- GAIN BREAK	GAIN BREAK =		
5-16- LOOP GAIN	LPGAIN =		
5-18- SLWDWN DIST	SLWDST =		
5-19- DISABL DIST	DISABL =		
5-29- SLWDWN RAD	SLWRAD =		
5-30- MIN RAD SPD	MRADSP =		
5-32- MIN SLW ANG	MINSLW =		
5-33- MAX SLW ANG	MAXSLW =		
5-45- DEFLT DWELL	DFDWEL =		
5-46- MIN OFF DWL	MINOFF =		
5-49- START DELAY	STRDLY =		

3. Retrieving Custom Aux Table Data – SERV78

The Burny 2.5 has the ability to convert the M and G or ESSI auxiliary functions in a part program into the functional codes needed by the Burny to cut the part. The data for making this conversion is contained in a list accessed by pressing the hidden "SERVICE" button, and then selecting the SERV78-CUSTOM AUX utility. Press ENTER to access the first entry in the list. There are 2 display formats used with this list—when the table is first accessed, the display will be in the "Table position" mode which shows which of the 50 possible entries is being displayed, and the current setting for that table location:

AUX01-M20-CUTOFF

This indicates that the first table location "AUX01" contains the data to convert an M20 code from a word address program into an internal Cut Off function—turn the oxygen or plasma off at the end of a cut.

Pressing ENTER at this point changes the display to show the TVVFF code for the AUX01 entry—the display will appear as:

32005-M20-CUTOFF

The 32005 is the TVVFF code:

T -- a single digit that defines the type of code begin converted (1-ESSI, 2-G code, 3-M code)

VV – a 2 or 3 digit value (up to 127) that defines the numeric value for the code (20 in this example)

FF – a 2 digit code defining the internal function assigned to the code (see Burny 2.5 manual for the list)

It is NOT necessary to understand what all these codes do to install the Burny 2.5 Plus processor card--- the important thing is to get them written down in the following chart so they can be re-entered in the new control.

The procedure would be to step through the list for each of the AUX entries and write down the data displayed for the block and the TVVFF displays.

While this list contains a maximum of 50 entries, the number of AUX table entries is usually much less. The end of the list is indicated by a display of a location being AVAILABLE. This means that no data has been entered for this table entry—the Burny will not search the table past this AVAILABLE location therefore any data following the first AVAILABLE location is not needed—it would not affect the controls operation in any way.

Begin stepping through the list and write down the data in the following chart:

3.1.1 AUX CODE TABLE DATA

Table location display: Example: AUX01 – M20 – CUT OFF	TVVFF display Example:32005 – M20 – CUT OFF
AUX01 -- --	-- --
AUX02 -- --	-- --
AUX03 -- --	-- --

AUX04	--	--	--	--
AUX05	--	--	--	--
AUX06	--	--	--	--
AUX07	--	--	--	--
AUX08	--	--	--	--
AUX09	--	--	--	--
AUX10	--	--	--	--
AUX11	--	--	--	--
AUX12	--	--	--	--
AUX13	--	--	--	--
AUX14	--	--	--	--
AUX15	--	--	--	--
AUX16	--	--	--	--
AUX17	--	--	--	--
AUX18	--	--		
AUX19	--	--		
AUX20	--	--		
AUX21	--	--		
AUX22	--	--		
AUX23	--	--		
AUX24	--	--		
AUX25	--	--		
AUX26	--	--		
AUX27	--	--		
AUX28	--	--		
AUX29	--	--		
AUX30	--	--		
AUX31	--	--		
AUX32	--	--	--	--
AUX33	--	--	--	--
AUX34	--	--	--	--
AUX35	--	--	--	--
AUX36	--	--	--	--

AUX37	--	--	--	--	
AUX38	--	--			
AUX39	--	--			
AUX40	--	--			
AUX41	--	--			
AUX42	--	--			
AUX43	--	--			
AUX44	--	--			
AUX45	--	--			
AUX46	--	--			
AUX47	--	--			
AUX48	--	--			
AUX49	--	--			
AUX50	--	--			

4. OPTION CODES

All of the Burny 2.5 and related Series 2 controls have various software options that are enabled by special "Lockout" codes based on the serial number of the control. While the new Burny 2.5 Plus card has all "options" now loaded as standard features, the Option Settings for the old board must be documented to determine some of the parameter settings on the new board.

There are two ways that this is done, depending on the age of the software in the existing control.

4.1 Option code display on very old systems.

Very old systems only display the options as a coded text string during power-up. The control will turn on and go through it's normal tests, and then display a text string as:

OPTN- C2D4007000

Each digit in this display references a particular option.

Turn the power Off, and back On to the control, and wait for this string to appear—then record the value in the following spaces (it may take several cycles of power Off/On to get the entire string written down correctly).

OPTN										

4.2 Option code display on newer Burny 2.5 (Series 2) systems

Controls with more recent software will have a display function called DSPY80 which tells the ON/OFF status of each option directly on the screen. Press the DSPY button and select DSPY80. When the ENTER button is pressed, the display will first show a sequence of values showing the serial number, hardware type and how much memory is used. Press the ENTER button during this sequence and the display will change to show:

OPTIONS

KERF --- ON or KERF --- OFF

Pressing enter will step down through this list and show the status of each option as ON or OFF. Record these values in the following chart for later use. Some of these options may not appear in the list since they are now considered "standard"—the chart has locations for them to make the recording process easier

4.2.1 Option ON/OFF status

OPTION NAME	ON/OFF
KERF	
SCALE	
ROTATE	
MIRROR	
PLATE ALIGN	
SERIAL COMM	
COMM ENHANCE	
CAD LINK	
PLATE MARKER	
STD. SHAPES	
TEACH	
KNIFE KERF	
CUSTOM AUX.	
LANGUAGE or individual language such as SPANISH, FRENCH, GERMAN, etc.	
FLOPPY DRIVE	
PRG. FDRT/KRF (programmable feedrate and kerf)	

5. BACKUP PART PROGRAMS

The final section of data that must be transferred from the existing Burny 2.5 to the new Burny 2.5 PLUS card are the stored part programs in the control. Part programs could have been created by either loading a Standard Shape, Template Teach, Downloading a program from the serial port or a Floppy, or creating a program using the Editor.

When the old processor card is removed from the system, these programs will be lost unless they are backed up to some external device. Some customers will already have all of their programs stored on the host computer, so there is no need to backup the data from the Burny 2.5. However, other customers will have programs created by template teach, that are only stored in the Burny 2.5's memory—these programs should be backed up if possible.

This can be done in two ways.

If the system is equipped with a serial port, and the external computing device can accept program uploads, use the STORE function in the Burny 2.5 to store to the RS-232 port and send all the internal programs up to the host computer.

If the system is equipped with an internal or external Floppy Disk drive, use the STORE function in the Burny 2.5 and store the programs to a series of floppy disks so they can be reloaded into the new card.

6. Power Off—Swap processor cards

Now that all the data from the existing Burny 2.5 processor card has either been stored to some external device, or recorded on this document on the lists provided, the old card can be removed, and the new card installed.

IMPORTANT: Remove all sources of AC power to the machine before performing any service work. The main power disconnect should be turned off and Locked in the OFF state to prevent someone from accidentally turning the power back on during the service operation.

WARNING: Proper handling procedures must be followed when installing the new MO-12438 Burny 2.5PLUS processor card. This card contains many high speed, high density electronic devices that can be damaged by STATIC ELECTRICITY caused by improper handling. Before removing the card from it's protective bag, the installing technician MUST use a grounded anti-static wrist strap connected to the machine chassis. All sources of STATIC ELECTRICITY should be removed from the area (any styrofoam, plastic packing material, bubble wrap, plastic paper sleeve protectors, etc). Once the board is removed from it's protective bag, it should be installed directly into the Burny system—do not lay it on a table or other surface that may not be grounded.

**The existing Burny 2.5 processor card should be placed back into the same protective anti-static bag after it is removed from the system. **

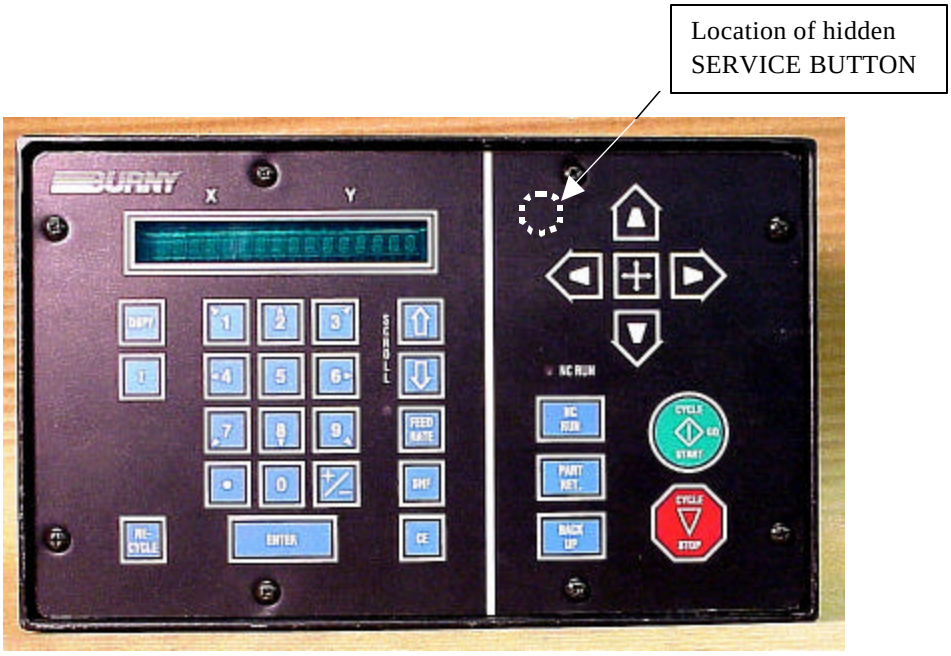


Figure 1- Typical Burny 2.5 Front Panel

Card installation:

1. Remove all sources of AC power to the machine, and lock-out the power disconnect to the machine to prevent accidental re-application of AC power during the service process.

2. Connect a grounded anti-static wrist strap to the machine frame and place it on the wrist of the installing technician.

3. Remove the screws holding the front panel of the product. For the Burny 2.5, these are the 8 screws around the keyboard panel. On the 1250 and 1400, there are 8 to 10 screws holding in the entire front hinged door. And finally, on the Burny 2.8, there are 22 screws holding the entire top cover of the cabinet—remove all but the bottom 4 screws along the lower front edge of the cabinet—just loosen the front 4 screws and lift the lid out of the slotted holes. See Figure 1.

4. Once the screws are removed, lay the front panel open so the screws holding the interface card to the processor card can be accessed.

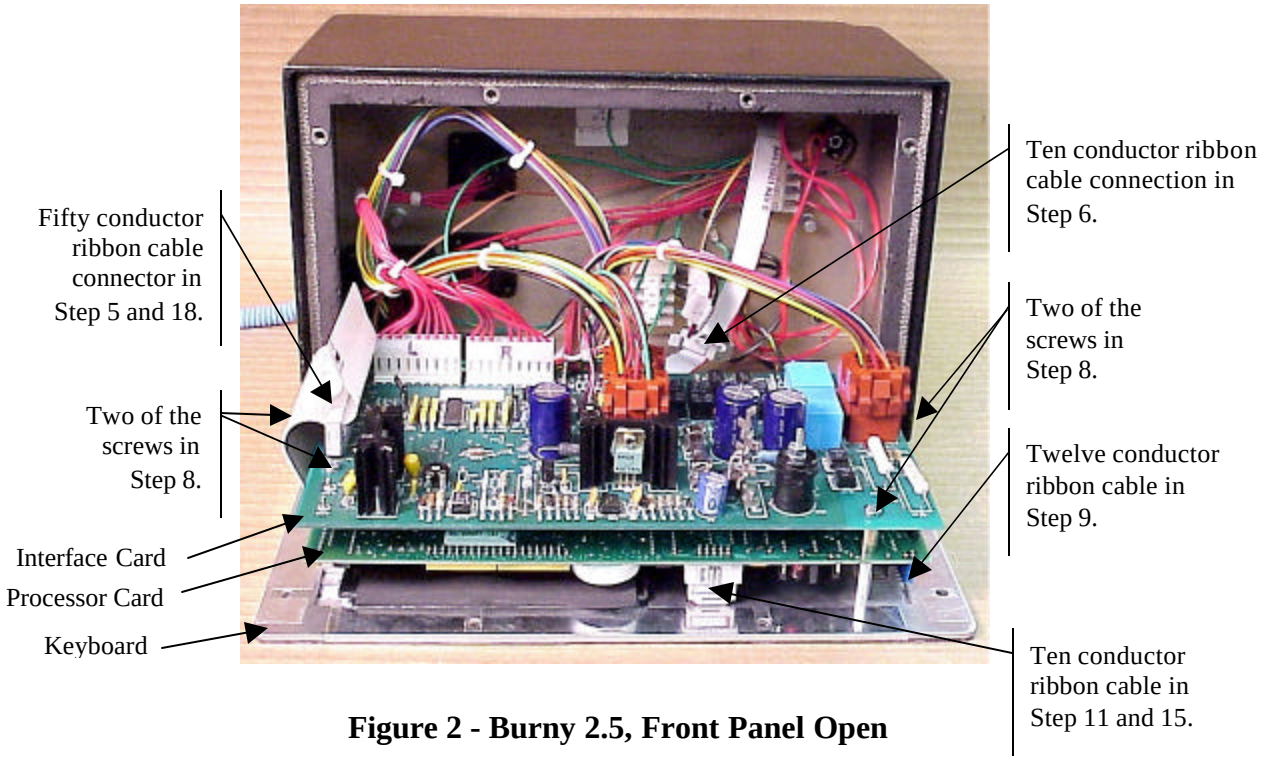


Figure 2 - Burny 2.5, Front Panel Open

5. Unplug the large 50 conductor ribbon cable that runs from the processor card to the interface card. See Figure 2.

6. Disconnect the 10 conductor ribbon cable from the processor card to the RS-232/422 modem. See Figure 2.

7. If installed, unplug the 14 conductor ribbon cable that runs from the processor card to the optional home limit switch input card used on some Burny 2.5 and 2.8 systems. See Figure 3.

8. Remove the 4 screws holding the interface card to the processor card in the system. This will make the interface and the processor card free floating so take care not to drop or stress the wires in the system during

this step. See Figure 2.

9. Lift the processor card slightly away from the keyboard panel, and unplug the 12 conductor ribbon that runs from the keyboard panel to the processor. See Figure 2.

10. Remove the old processor card from the system.

11. Remove the short 10 and/or 14 conductor ribbon cables from the old processor card—these will be re-used with the new card. See Figure 3.

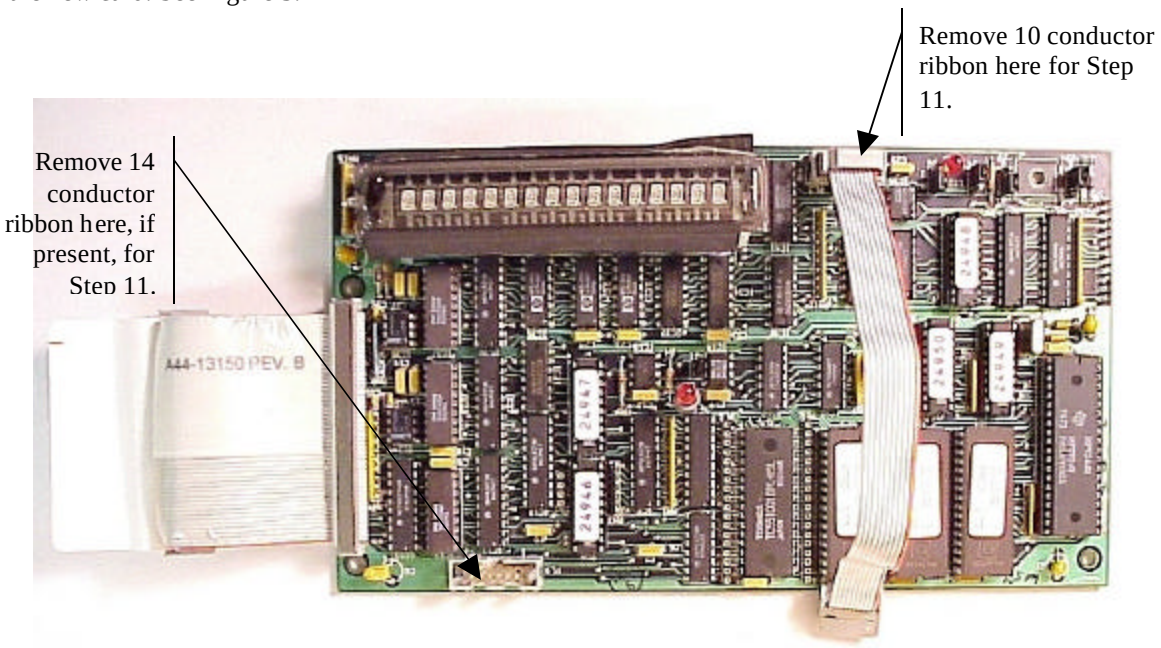


Figure 3 - Burny 2.5 Existing Processor Board

12. If a Burny 2.8 is being updated, remove the old keyboard by removing the 6 screws around the bezel on the front of the unit and discarding the old keyboard. Install the new keyboard supplied with the updated kit using the same screws and bezel as the old panel.

13. If a Burny 2.5 is being updated, discard the old keyboard. Use the new keyboard supplied with the update kit.

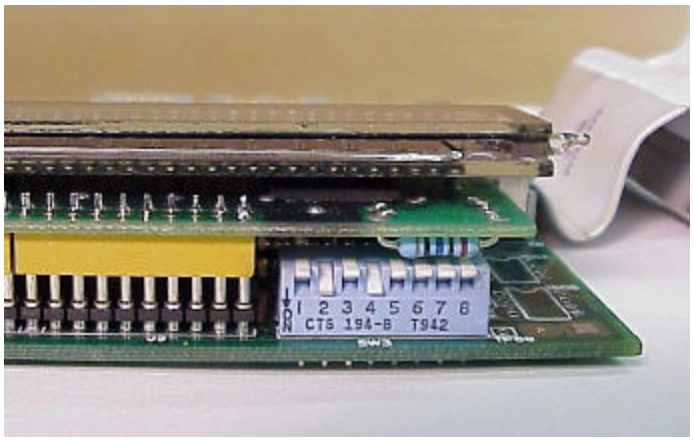


Figure 4 - DIP Switch in Step 14

14. Remove the new MO-12438 processor card from it's protective bag. See Figure 5 and 9. Set the DIP switch located on the new card under the readout as follows:

    - When using the MO-12438 card with any of the Burny 2.5 type keyboards that include the **4 DIRECTIONAL JOG ARROWS,** or with a **Burny 1250** or **Burny 1400** keyboard which also include the jog arrow buttons, the DIP switch on the MO-12438 **MUST** be set as follows:

      Position 1 -- OFF
      Position 2 -- ON
      Position 3 -- OFF
      Position 4 -- ON
      Position 5 -- OFF
      Position 6 -- OFF
      Position 7 -- OFF
      Position 8 -- OFF

      See Figure 4 -- these are the proper jumper settings when used with the new Burny 2.5 Plus front panel.

    - See APPENDIX A for details and precautions for using the MO-12438 card with older style Burny 2.5, 2.8 and private label keyboard panels.

15. Re-connect the 10 and/or 14 conductor ribbon cables to the new processor card—the connectors for these cables are located in almost the exact same location as the old card. Take care that the 10 pin cable for the serial RS-232/422 port is connected to the J4 connector on the new card. There is another 10 pin connector on the new processor card that will be used for software updates—but it will not function for the RS-232 port use. See Figure 5.

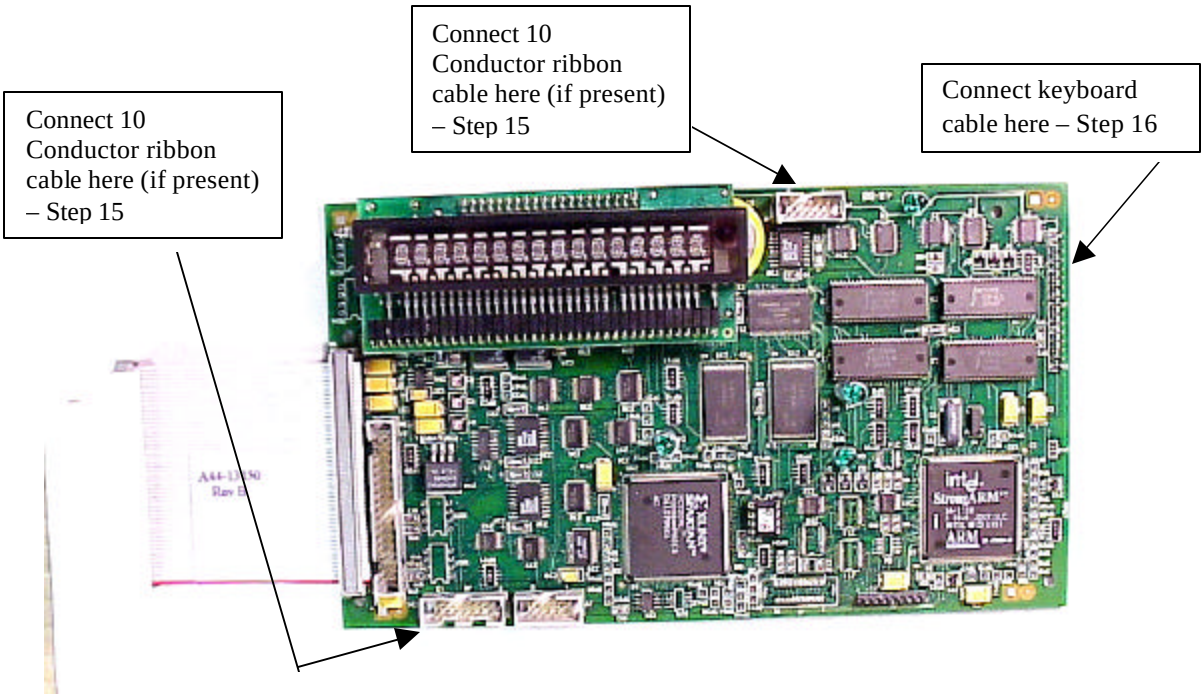


Figure 5 - Front of New Processor Board

16. Place the new MO-12438 card over the keyboard, and connect the ribbon from the keyboard to the J1 connector on the new processor card. Be sure to apply the ribbon connector starting at pin 1 of the J1 connector—the new processor card has some extra pins included in the J1 connector for future expansion—the older keyboards must be connected to the original 12 input pins. Also make sure the 10 or 14 conductor additional ribbon cables are routed under the card properly and are not pinched or interfering with the LED's or other devices.

17. Align the interface card and new processor over the keyboard standoffs, and replace the 4 screws to hold these two boards together.

18. Connect the 10, 14 and 50 conductor ribbon cables to their respective locations in the system. See Figure 2.

19. Replace the keyboard in the cabinet on 2.5 systems, close the door on the 1250/1400 or replace the 2.8's cabinet lid and replace the screws to hold in the panel or door. Make sure all screws are tight to insure a dust tight seal around the opening.

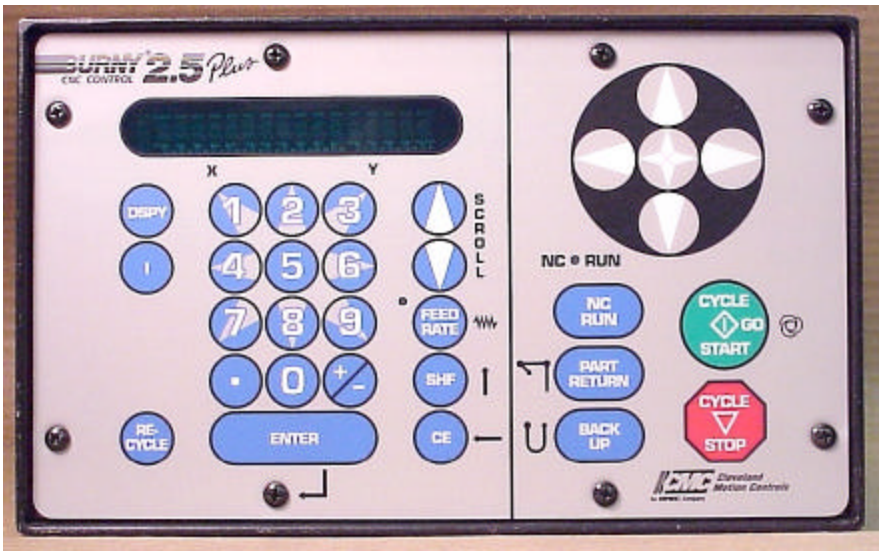


Figure 6 - Burny 2.5 *Plus* Front Panel

20. Remove the wrist strap now that the new card is installed and the cabinet is closed

21. Continue with this procedure to re-install all the data needed to make the new board function on the machine.

7. Power ON – Re-install saved data

Now that the mechanical installation of the new card is complete, the new card must be configured to run the system and act the same as the card that was removed. There will be some changes in the operation of the controls since you are updating the software to the most recent software version as a result of this card exchange. Consult the new Burny 2.5 operation manual supplied with the update kit for details on how to operate the new features.

1. Re-Apply AC power to the cutting machine and turn on the Burny system if there is a separate switch. The control should power up normally and display the familiar READY --- SELECT FUNCTION message.

2. DO NOT enable the servo drives for the system. If possible, disengage the pinion gears from the drive rack so that the machine. This is done as a precaution until it is confirmed that the parameters are working correctly in the new system.

3. Verify that the keyboard works properly. Try several operations to verify that most of the keys work correctly.

4. Press the hidden SERVICE button and select the SERV52- MEM RESET. Press ENTER and answer YES to both prompts to reset the program storage memory. After the process is done, use the DSPY80 function to display the amount of memory Used and Available. There should be almost 512K bytes available—this is the standard memory size on the MO-12438 Burny 2.5 Plus processor card.

5. Press the hidden SERVICE button and access the SERV10 parameter list. GO back to section 2.1.1 of this document and enter all the parameters in the SERV10 list. ALL PARAMETERS must be entered into the new card—do not skip any of the entries. If a value was not found in the old card, there is a suggested DEFAULT value in the table that should be entered into the new card. After the system is running, these new parameters may need to be re-adjusted to give optimal machine performance—see the new manual shipped with the update for details on the new parameter settings.

SPECIAL REQUIREMENTS FOR OLDER SYSTEMS

If the MO-12438 is being used to replace the older MO-03370, MO-4873, or MO-04875 processor cards—see APPENDIX B for information regarding the encoder scaling jumpers on these old cards, and how it affects the setup parameters

6. Refer back to Section 4 of this document where the OPTIONS from the old board were recorded. All of the features that used to be referred to as OPTIONS are now all STANDARD features in the Burny 2.5 Plus—there are no special option codes to enter. However, 2 of these old OPTION capabilities require a setting of one of the setup parameters to either ENABLE or DISABLE the feature.

COMM ENHANCE OPTION

Parameter SD51 now has a bit to control the COMM ENHANCE OPTION. This is an 8 digit parameter--for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the COMM ENHANCE option was ON with the old board, set digit D3 of the SD51 parameter to 0. (xx0xxxxx). This will cause the COMM ENHANCE to function on the new card.

- If the COMM ENHANCE option was OFF with the old board, set digit D3 of parameter SD51 to an "8" to disable the COMM ENHANCE feature on the new board— (xx8xxxxx).

KNIFE KERF OPTION

Parameter SD63 now has a bit to control the KNIFE KERF OPTION. Knife kerf is a special mode for the kerf routine that is used by the sign making industry for the special requirements of the drag knife used for cutting vinyl material, or for router cutting of plastic and aluminum for signs.

This is an 8 digit parameter-- for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the KNIFE KERF option was ON with the old board, set digit D3 of the SD63 parameter to a 1. (xx1xxxxx). This will cause the KNIFE KERF to function on the new card.

- If the KNIFE KERF option was OFF with the old board, set digit D3 of parameter SD51 to an "0" to disable the KNIFE KERF feature on the new board— (xx0xxxxx).

7. Press the hidden SERVICE button again, and access the SERV41 overlay table list. Go back to section 2.2.1 of this document and re-enter all the parameters saved from the SERV41 list in the old control.

8. Press the hidden SERVICE button again, and access the SERV42 overlay table list. Go back to section 2.3.1 of this document and re-enter all the parameters saved from the SERV42 list in the old control.

9. Press the hidden SERVICE button again, and access the SERV43 overlay table list. Go back to section 2.4.1 of this document and re-enter all the parameters saved from the SERV43 list in the old control.

10. Press the hidden SERVICE button again, and access the SERV44 overlay table list. Go back to section 2.5.1 of this document and re-enter all the parameters saved from the SERV44 list in the old control.

11. Press the hidden SERVICE button again, and access the SERV45 overlay table list. Go back to section 2.6.1 of this document and re-enter all the parameters saved from the SERV45 list in the old control.

12. Press the hidden SERVICE button and perform the SERV97 procedure to store the new parameters so they will not be lost when the power is turned off.

13. Press the hidden SERVICE button and select the SERV51-SPD CAL function—press ENTER to select the function, but DO NOT follow the prompts on the screen regarding the CYCLE START button. Instead, press the hidden SERVICE button again, and now select the SERV97 function and store the cleared speed calibration data.

14. Press the hidden SERVICE button and access the SERV78-CUSTOM AUX code conversion table. Go back to section 3.1.1 and re-enter all the data saved for the Custom AUX table from the old control. The procedure would be to press the ENTER button to get to the next AUX location, then press ENTER again to access the TVVFF entry screen. Enter the TVVFF code saved from the old control (32005) and press ENTER. You can scroll back to a previous entry to check it if desired.

15. The control should now be operational. Turn on the servo drives and test the motion of the machine. See the manual that came with this update kit for details on the new setup parameters for help in adjusting the machine's performance.

8. Appendix A – DIP Switch settings for older Burny 2.5 Front Panels

Older front panels for the Burny 2.5, as well as several of the private labeled versions did not include the 4 Directional JOG ARROWS as shown in the pictures. These panels used a sequence of pressing the II button, then used the numbered keyboard to select the jog direction.

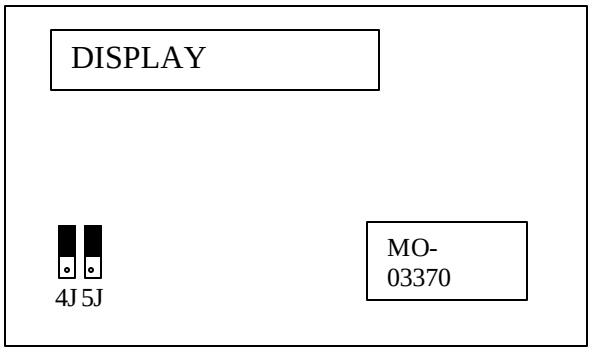
To configure the new MO-12438 board to work correctly with these older panels, the DIP switches must be set to match the configuration jumpers from the old boards.

DIP switch settings for MO-03370 processor card replacement

SW1 – ON
SW2 – OFF
SW3 – OFF
SW4 – Set to ON if Jumper 4J is set AWAY from the display.
Set to OFF if Jumper 4J is set TOWARD the display.

SW5 – Set to ON if Jumper 5J is set AWAY from the display.
Set to OFF if Jumper 5J is set TOWARD the display.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-04873 or MO-04875 processor card replacement

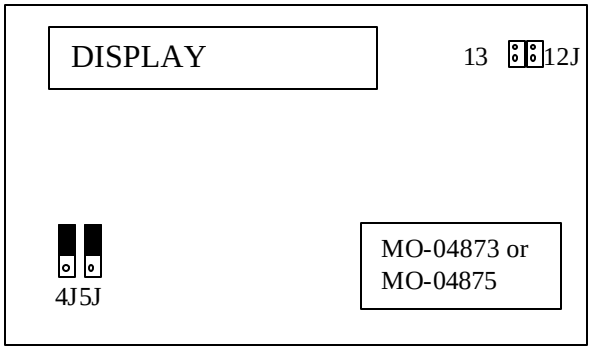
SW1 – ON
SW2 – Set to OFF if Jumper 12J is missing,
Set to ON if jumper J12 is installed

SW3 – Set to OFF if Jumper 13J is missing,
Set to ON if jumper J13 is installed

SW4 – Set to ON if Jumper 4J is set AWAY from the readout.
Set to OFF if Jumper 4J is set TOWARD the readout.

SW5 – Set to ON if Jumper 5J is set AWAY from the readout.
Set to OFF if Jumper 5J is set TOWARD the readout.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-08601 or MO-11249 processor card replacement

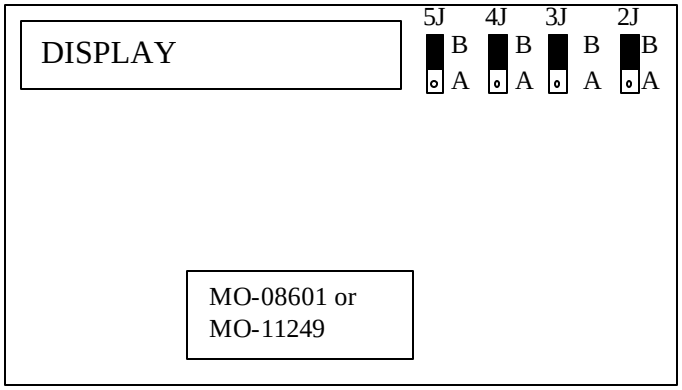
SW1 – ON
SW2– Set to OFF if Jumper J2 is set to “A”,
Set to ON if Jumper J2 is set to “B”

SW3– Set to OFF if Jumper J3 is set to “A”,
Set to ON if Jumper J3 is set to “B”

SW4– Set to OFF if Jumper J4 is set to “A”,
Set to ON if Jumper J4 is set to “B”

SW5– Set to OFF if Jumper J5 is set to “A”,
Set to ON if Jumper J5 is set to “B”

SW6, SW7, SW8 – All set to OFF



9. Appendix B – Changes to Encoder Scaling for older 2.5 updates

The older MO-03370, MO-04873 and MO-04875 processor cards included hardware jumpers J6 thru J9 on the card. These were used to tolerate faster encoder counting frequencies that could not be handled by the hardware. The newer 2.5 processor cards use faster encoder counting circuitry and eliminated these jumpers.

If one of these older boards (3370,4873,4875) are being replaced, the setting of these jumpers can affect the parameters entered into the new MO-12438 card.

If all 4 of the jumpers J6,J7,J8 and J9 are set toward the display (See Fig. 1), then the setup parameters from the old board can be directly entered into the new card.

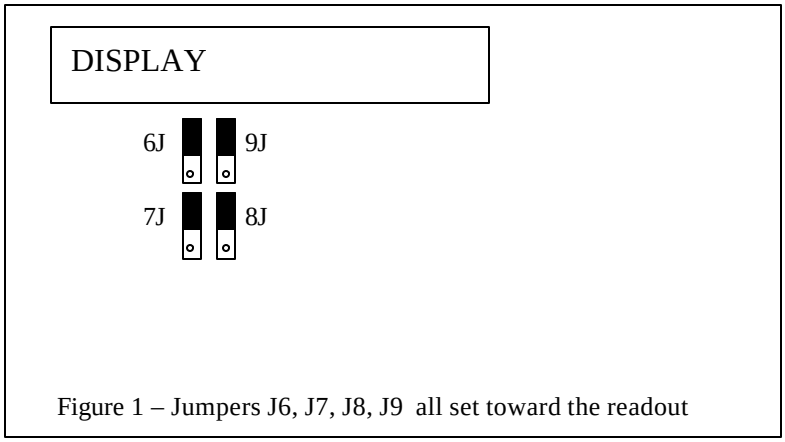


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

Some installations may be using faster encoders, particularly motor mounted encoders, and may have these jumpers set the opposite direction. If all 4 of the jumpers J6,J7, J8, J9 (Figure 2) are set away from the DISPLAY, then the value recorded for parameter SD22- ENC LINES/REV must be multiplied by 4. So for example, a system where the old card had a setting of 500 for SD22 would need to have 2000 entered into the new MO-12438 to work properly.

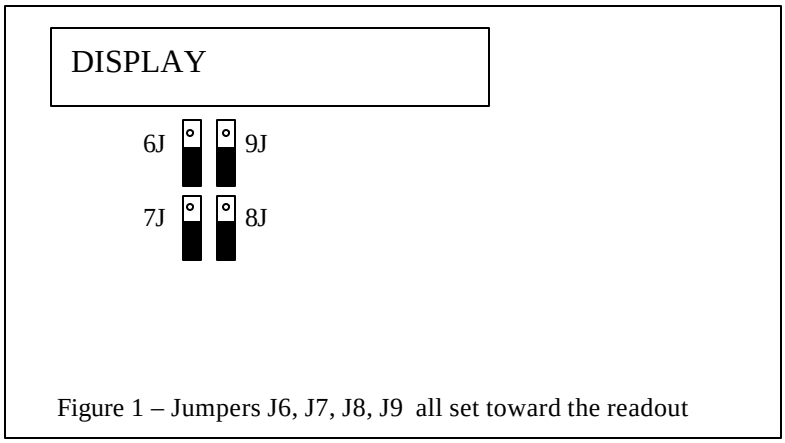


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

If the old system has jumpers J6, J7, J8, J9 set to any other random pattern, contact the factory since this will require modifying several of the system parameters. This is very uncommon.

10. Appendix C "Burny 2.5 Plus-- New features and Capabilities"

The goal of the 2.5 Plus development program was to produce a new version of the computer board in the Burny 2.5 series products that would improve the speed and system performance, without affecting the basic operation. The 2.5 Plus processor card will perform RS-232 downloads, and the Kerf calculations 80-90% faster than the older cards.

Most of the prompting, displays and operator inputs are exactly the same as the older cards—so there is little or no re-training required when the new 2.5 Plus card is substituted for an older card. However, there is the problem that the 2.5 Plus basically copies the operation of the Burny 2.5 software that was in existence at the end of 1999. If the older 2.5 card had software dating back many years (could go back as far as 1988), then there will be substantial differences in the machine's operation due to the changes and improvements that have occurred over the years of software development on the Burny 2.5 product line. This may require some additional training for the operators to become familiar with the new operation of the control, and the new capabilities available to the operator. See the new OPERATION MANUAL supplied along with this Burny 2.5 Plus product for details on all the current features of the product.

The two main areas where a difference will be noted are in the Serial I/O downloading speeds, and the Kerf processing speed.

Kerf Processing speed

The Kerf process is self contained within the Burny 2.5 Plus—there is no interaction with the outside world so the process can function at peak efficiency.

Serial I/O Downloading Speed

The Serial I/O downloading is a different matter. Since the Serial I/O communication via the RS-232/422 port connects to devices outside the Burny product, the performance of the downloading system is very dependent on the performance and setting of the external devices. For example, if the existing cutting machine had the BAUD rate set to 2400 Baud for the serial downloading speed, there will be NO increase in performance of the Serial Downloading speed with the Burny 2.5 Plus—the older card work just as well at 2400 baud as the new 2.5 Plus card. To fully take advantage of the new downloading speed capacity of the Burny 2.5 Plus card, the external system must be capable of supplying the data faster also. The following is an ESTIMATE of the speed improvement expected for various Baud rate settings of the Burny 2.5 Plus. Note that the higher baud rate settings were not even possible with the older Burny 2.5 which was normally used up to about 4800 baud.

Serial I/O Downloading Baud Rate setting	ESTIMATED speed improvement with Burny 2.5 Plus.
300 to 2400 Baud	0%-- Same speed as older card
4800 Baud	25% Less time for download
9600 Baud	60% Less time for download
19.2K Baud	80% Less time for download
28.8K Baud	80% Less time for download
38.4K Baud	75% Less time for download
57.6K to 230K Baud	60-75% Less time—note that these very high baud rates require more system overhead and are actually LESS EFFICIENT than the somewhat slower settings from 19.2K to 38.4K Baud

Serial Number and Option codes

The Burny 2.5 Plus software does not use Option codes—all possible features for the product are available as Standard capabilities with every system that ships. Similarly, there is no longer a SERIAL NUMBER imbedded into the product—the display will show " SERIAL 0" for all Burny 2.5 Plus products. The main purpose for the Serial number was to control the software lockout codes for the options—no more options means no more serial number.

The fact that all Options are now standard will cause some new menus and displays to show up on older controls where a particular option was missing before. For example, if an older Burny 2.8 did not have the STANDARD SHAPES option installed, there would not have been a menu choice for "LOAD-STANDARD SHAPE" in the select function list. When the 2.5 Plus card is installed, the operator will now see this "LOAD- STANDARD SHAPE" prompt – this should be explained to the operator ahead of time to avoid possible confusion.

The following is a list of the features that will now appear on all controls—the ones marked ** may have been missing from the older card—they are now provided as a standard capability of the new Burny 2.5 Plus software:

- RUN- PROGRAM
- LOAD- FROM STD SHAPE ** (Older card required Standard Shape option to be enabled)
- LOAD- FROM RS-232 ** (Older card required Serial I/O Option to be enabled)
- STORE- TO RS-232 ** (Older card required Serial I/O Option to be enabled)
- TEACH- PROGRAM ** (Older card required Teach Option to be enabled)
- DELETE-PROGRAM
- EDIT-PROGRAM ** (Very old cards could only access EDIT via DSPY20-)
- LOAD- FROM FLOPPY ** (Older cards required Floppy option to be enabled)
- STORE- TO FLOPPY ** (Older cards required Floppy option to be enabled)
- LOAD/RUN- RS-232 ** (Older cards required Serial I/O option to be enabled)
- LOAD/RUN-FLOPPY ** (Older cards required Floppy option to be enabled)

Some operators may complain that they have to Scroll through too many choices in this new expanded list of features to get what they want. Remember that these choices can be made with a single button push as described in the operation manual— as a reminder, the following number keys select the indicted function:

- RUN- PROGRAM -- Press the number 1 on the keypad
- LOAD- FROM STD SHAPE -- Press the number 2 on the keypad
- LOAD- FROM RS-232 -- Press the number 3 on the keypad
- STORE- TO RS-232 -- Press the number 4 on the keypad
- TEACH- PROGRAM -- Press the number 5 on the keypad
- DELETE-PROGRAM -- Press the number 6 on the keypad
- EDIT-PROGRAM -- Press the number 7 on the keypad
- LOAD- FROM FLOPPY -- Press the number +/- on the keypad
- STORE- TO FLOPPY -- Press the number . (decimal point) on the keypad
- LOAD/RUN- RS-232 -- Press the number 3, then the SHF on the keypad
- LOAD/RUN-FLOPPY -- Press the +/- key, then the SHF on the keypad

Blank

Burny 2.5 PLUS Update

Installation instructions for field upgrades using the Burny 2.5 PLUS processor card.

Also for use with MO-12685 and MO-12742 upgrade kits

ECO REVISION HISTORY

Revision	*Description*	*ECO*	*Date*
-AA	Written	---	28-July-00
-BA	Add photos, DIP Switch and parameter for old cards	CLE1716	07-Dec-00

Spec No.:	*Division:* BURNY
Author: RDM	*Rev:* **BA**
File name: AO-90177BA.doc	*Date:* **7-Dec-2000**

Cleveland Motion Controls
An IMC Company

REVISION HISTORY

Rev AA	RDM (28-July-2000) -- Written
Rev BA	JRB (7-Dec-2000) -- Added retrofit Figures and references
	RDM(7-Dec-2000) -- Add APPENDIX A,B for Dip switch settings for older front panels, and APPENDIX B for modifications needed to Encoder Scaling parameters when MO-3370 or 4873 or 4875 board was replaced.

TABLE OF CONTENTS

1. INTRODUCTION

These instructions document the steps needed to update existing Burny 2.5 controls, or any of the other Series 2 controls (1250,1400, 2.8, 2.9) with the new MO-12438 Burny 2.5 Plus processor card. The procedure assumes the installer is familiar with the Burny products and is capable of the mechanical assembly/disassembly and entry of parameters into the system.

For updates on a Burny 1250 or Burny 1400 system, the original keyboard can still be used—just the processor card is replaced as described in the following procedures.

For Burny 2.5, Burny 2.8 or Burny 2.9 systems, a special part number MO-12685 has been created to provide a new processor card with the new 2.5 Plus keyboard. This is necessary since the older Burny 2.5 keyboards do not have the proper clearance in the aluminum panel for the current readout used on the Burny 2.5 products. By ordering this MO-12685 kit, the installer is assured of having a panel that works fits the readout.

The main purpose of this particular procedure is to document all of the stored parameters, option codes, Aux code conversion tables, etc. which are configured in the existing Series 2 control BEFORE the new processor card is installed. Once the new card is operational, this stored data from the old system will be re-entered with the goal of making the new card capable of running the machine in as little time as possible.

2. PARAMETER and SYSTEM DATA RETRIEVAL

Before disassembling anything, the installer must first retrieve all the data stored in the existing Burny 2.5 system. There is no automatic way to do this with the older software, therefore the data must be manually obtained. The following pages have procedures and tables to be used to write down the parameter data, Code Conversion table data, and options enabled in the current system. Then, after the new processor card and panel are installed, these values must be manually re-entered into the new system. If this process is done correctly, and attention is paid to getting the data correct, the new system should begin operation with no further tuning required.

2.1 System Data Parameters-SERV10

With the existing system operating normally, press the hidden "SERVICE" button and access SERV10-SYS DATA. Press ENTER to display the main system parameter list. The display shows the first parameter as:

SD01-ARC ON DELAY

Press the ENTER button a second time to display the value currently set for this parameter—if the Arc On delay had been set for 3 seconds, the display would now show:

AONDLY = 3.00

Write down this 3.00 value in the following table. Press the ENTER button to access the next parameter name, and then press the ENTER button a second time to access the value—the display would have showed:

SD02-BLEEDOFF then BLEDOF= 2.00 (2 seconds used for this example)

Continue stepping through the entire list of parameters and write their values in the able provided.

IMPORTANT: Older systems may not include all the parameters shown on this list.

Older systems had less parameters than the current Burny 2.5—therefore it is important to carefully pay attention to the parameter number displayed on the screen, and match it to the table before writing the value. Any parameters that were not included in the old system will be handled during the installation portion for the new card.

2.1.1 SERV10 PARAMETERS

Parameter Number and Name	PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN	Default value to be used for older systems where a parameter was not part of the older products list.	Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system
SD01- ARC ON TIME	ARCDLY =		
SD02- BLEEDOFF	BLEDOF =		
SD03- ACCEL TIME	ACCTME =		
SD04- MAX DRV SPD	MAXSPD =		
SD06- BACKUP SPD	BCKSPD =		
SD07- CORNER SPD	CORSPD =		
SD08- MIN HLD SPD	MINHLD =		
SD09- ERR SPD MAX	ERRSPD =	20 inch/min 400 mm/min	

SD10- RUNSPD LIMIT	RUNLMT =		
SD11- TRAVERS LMT	TRVLMT =		
SD12- MIN ACCEL	MIN ACCEL =	.20 seconds	
SD14- GAIN BREAK	GAIN BREAK =	0	
SD15- ERR WRN DST	WRNDST =		
SD16- LOOP GAIN	LPGAIN =		
SD17- ARC OFF DLY	AOFDLY =	2.0 seconds	
SD18- SLWDWN DIST	SLWDST =		
SD19- DISABL DIST	DISABL =	.25 inches 6.3 mm	
SD20- X ENC DIST	XENSCL =		
SD21- Y ENC DIST	YENSCL =		
SD22- ENC LIN/REV	ENC LINES =		
SD23- X ENC DIR	X ENC DIR -		
SD24- Y ENC DIR	Y ENC DIR -		
SD25- X DRV DIR	X DRV DIR -		
SD26- Y DRV DIR	Y DRV DIR -		
SD27- PLATE SIDE	PLATE ON -		
SD28- HEIGHT RLY	CONTACT -		
SD29- SLWDWN RAD	SLWRAD =		
SD30- MIN RAD SPD	MRADSP =	30 inches/min 150 mm/min	
SD31- PLASMA TB1	PLASMA TB1 =	NO	
SD32- MIN SLW ANG	MINSLW =	10	
SD33- MAX SLW ANG	MAXSLW =	22	
SD40- X MARK OFF	XOFST1 =		
SD41- Y MARK OFF	YOFST1 =		
SD42- MARKER SPD	MRKSPD =		
SD43- MARK DELAY	MRKDLY =		
SD45- DEFLT DWELL	DFDWEL =		
SD46- MIN OFF DWL	MINOFF =		
SD47- XOFST2	XOFST2 =		

SD48- YOFST2	YOFST2=		
SD49- START DELAY	STRDLY =	1.5 seconds	
SD50- SERIAL DEFN	SERIAL DEFN =		
SD5- PRGM FORMAT	PGMFMT =		
SD52- SPECIAL EOP	EOP 1 =		
SD53- FILE EXTEN	FEXTEN =	434E4300	
SD60- OPER SYS	OPER SYS =		
SD61- SYS CONFG 1	SYSCFG1 =		
SD62- SYS CONFG 2	SYSCFG2 =		
SD63- SYS CONFG 3	SYSCFG3 =	0	
SD65- OVERLAY CFG	OVERLAY CFG =	0	
SD68- SPEED RANGE	SPEED RANGE =	4	
SD69- LA NGUAGE	LANGUAGE =	0	
SD70- KNF ROT DIA	KNFDIA =		
SD71- KNF B.P. ANG	KNF B.P. ANG =		
SD74- T2XHOM	T2XHOM =		
SD75-T2YHOM	T2YHOM =		
SD76- T3XHOM	T3XHOM =		
SD77- T3YHOM	T3YHOM =		
SD78- T4XHOM	T4XHOM =		
SD79- T4YHOM	T4YHOM =		
SD80- XOFST1	XOFST1 =		
SD81- XOFST1	YOFST1 =		
SD82- XOFST2	XOFST2 =		
SD83- XOFST2	YOFST2 =		
SD84- XOFST3	XOFST3 =		
SD85- XOFST3	YOFST3 =		
SD86- XOFST4	XOFST4 =		
SD87- XOFST4	YOFST4 =		
SD88- XOFST5	XOFST5 =		

SD89- XOFST5	YOFST5 =		
SD90- XOFST6	XOFST6 =		
SD91- XOFST6	YOFST6 =		
SD92- XOFST7	XOFST7 =		
SD93- XOFST7	YOFST7 =		
SD94- XOFST8	XOFST8 =		
SD95- XOFST8	YOFST8 =		
SD96- XHOMSW	XHOMSW =		
SD97- XHOMSW	YHOMSW =		
SDA0- XBKLSH	XBKLSH =	0	
SDA1- YBKLSH	YBKLSH =	0	
SDA2- LSH RATE	LSH RATE =		
SDD0- SYNC W-AXIS	SYNC ENABLE =	NO	
SDD1- W GAIN	W GAIN =		
SDD2- SKEW LIMT	SKWLMT =		
SDD3- W MAX SPD	WMXSPD =		
SDD4- W ENC DIR	W ENCODER =		
SDD5- W DRV DIR	W DRIVE =		
SDD6- WBKLSH	WBKLSH =		
SDD7 – W OFFSET	WOFSET =		

2.2 System Overlay Table #1 Parameters - SERV41

Burny 2.5 systems built after 1983 had the 5 sets of additional setup parameters which could be selected by programming codes within a part program to "overlay" the standard SERV10 parameter list. Access this list of values by pressing the hidden "SERVICE" button and access SERV41-TB 1 DATA. Press ENTER to display the overlay table #1 list. Note this list is much shorter than the SERV10 list. Again, carefully step down through the list and write the values in the following list:

2.2.1 SERV41 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
1-03- ACCEL TIME	ACCTME =		
1-07- CORNER SPD	CORSPD =		
1-10- RUNSPD LIMIT	RUNLMT =		
1-12- MIN ACCEL	MIN ACCEL =		
1-14- GAIN BREAK	GAIN BREAK =		
1-16- LOOP GAIN	LPGAIN =		
1-18- SLWDWN DIST	SLWDST =		
1-19- DISABL DIST	DISABL =		
1-29- SLWDWN RAD	SLWRAD =		
1-30- MIN RAD SPD	MRADSP =		
1-32- MIN SLW ANG	MINSLW =		
1-33- MAX SLW ANG	MAXSLW =		
1-45- DEFLT DWELL	DFDWEL =		
1-46- MIN OFF DWL	MINOFF =		
1-49- START DELAY	STRDLY =		

2.3 System Overlay Table #2 Parameters - SERV42

Continue with this process to access the data in Overlay Table #2 by pressing the hidden "SERVICE" button and access SERV42-TB 2 DATA. Press ENTER to display the overlay table #2 list.

2.3.1 SERV42 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
2-03- ACCEL TIME	ACCTME =		
2-07- CORNER SPD	CORSPD =		
2-10- RUNSPD LIMIT	RUNLMT =		
2-12- MIN ACCEL	MIN ACCEL =		
2-14- GAIN BREAK	GAIN BREAK =		
2-16- LOOP GAIN	LPGAIN =		
2-18- SLWDWN DIST	SLWDST =		
2-19- DISABL DIST	DISABL =		
2-29- SLWDWN RAD	SLWRAD =		
2-30- MIN RAD SPD	MRADSP =		
2-32- MIN SLW ANG	MINSLW =		
2-33- MAX SLW ANG	MAXSLW =		
2-45- DEFLT DWELL	DFDWEL =		
2-46- MIN OFF DWL	MINOFF =		
2-49- START DELAY	STRDLY =		

2.4 System Overlay Table #3 Parameters - SERV43

Continue with this process to access the data in Overlay Table #3 by pressing the hidden "SERVICE" button and access SERV43-TB 3 DATA. Press ENTER to display the overlay table #3 list.

2.4.1 SERV43 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
3-03- ACCEL TIME	ACCTME =		
3-07- CORNER SPD	CORSPD =		
3-10- RUNSPD LIMIT	RUNLMT =		
3-12- MIN ACCEL	MIN ACCEL =		
3-14- GAIN BREAK	GAIN BREAK =		
3-16- LOOP GAIN	LPGAIN =		
3-18- SLWDWN DIST	SLWDST =		
3-19- DISABL DIST	DISABL =		
3-29- SLWDWN RAD	SLWRAD =		
3-30- MIN RAD SPD	MRADSP =		
3-32- MIN SLW ANG	MINSLW =		
3-33- MAX SLW ANG	MAXSLW =		
3-45- DEFLT DWELL	DFDWEL =		
3-46- MIN OFF DWL	MINOFF =		
3-49- START DELAY	STRDLY =		

2.5 System Overlay Table #4 Parameters - SERV44

Continue with this process to access the data in Overlay Table #4 by pressing the hidden "SERVICE" button and access SERV44-TB 4 DATA. Press ENTER to display the overlay table #4 list.

2.5.1 SERV44 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
4-03- ACCEL TIME	ACCTME =		
4-07- CORNER SPD	CORSPD =		
4-10- RUNSPD LIMIT	RUNLMT =		
4-12- MIN ACCEL	MIN ACCEL =		
4-14- GAIN BREAK	GAIN BREAK =		
4-16- LOOP GAIN	LPGAIN =		
4-18- SLWDWN DIST	SLWDST =		
4-19- DISABL DIST	DISABL =		
4-29- SLWDWN RAD	SLWRAD =		
4-30- MIN RAD SPD	MRADSP =		
4-32- MIN SLW ANG	MINSLW =		
4-33- MAX SLW ANG	MAXSLW =		
4-45- DEFLT DWELL	DFDWEL =		
4-46- MIN OFF DWL	MINOFF =		
4-49- START DELAY	STRDLY =		

2.6 System Overlay Table #5 Parameters - SERV45

Continue with this process to access the data in Overlay Table #5 by pressing the hidden "SERVICE" button and access SERV45-TB 5 DATA. Press ENTER to display the overlay table #5 list.

2.6.1 SERV54 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
5-03- ACCEL TIME	ACCTME =		
5-07- CORNER SPD	CORSPD =		
5-10- RUNSPD LIMIT	RUNLMT =		
5-12- MIN ACCEL	MIN ACCEL =		
5-14- GAIN BREAK	GAIN BREAK =		
5-16- LOOP GAIN	LPGAIN =		
5-18- SLWDWN DIST	SLWDST =		
5-19- DISABL DIST	DISABL =		
5-29- SLWDWN RAD	SLWRAD =		
5-30- MIN RAD SPD	MRADSP =		
5-32- MIN SLW ANG	MINSLW =		
5-33- MAX SLW ANG	MAXSLW =		
5-45- DEFLT DWELL	DFDWEL =		
5-46- MIN OFF DWL	MINOFF =		
5-49- START DELAY	STRDLY =		

3. Retrieving Custom Aux Table Data – SERV78

The Burny 2.5 has the ability to convert the M and G or ESSI auxiliary functions in a part program into the functional codes needed by the Burny to cut the part. The data for making this conversion is contained in a list accessed by pressing the hidden "SERVICE" button, and then selecting the SERV78-CUSTOM AUX utility. Press ENTER to access the first entry in the list. There are 2 display formats used with this list—when the table is first accessed, the display will be in the "Table position" mode which shows which of the 50 possible entries is being displayed, and the current setting for that table location:

AUX01-M20-CUTOFF

This indicates that the first table location "AUX01" contains the data to convert an M20 code from a word address program into an internal Cut Off function—turn the oxygen or plasma off at the end of a cut.

Pressing ENTER at this point changes the display to show the TVVFF code for the AUX01 entry—the display will appear as:

32005-M20-CUTOFF

The 32005 is the TVVFF code:

T -- a single digit that defines the type of code begin converted (1-ESSI, 2-G code, 3-M code)

VV – a 2 or 3 digit value (up to 127) that defines the numeric value for the code (20 in this example)

FF – a 2 digit code defining the internal function assigned to the code (see Burny 2.5 manual for the list)

It is NOT necessary to understand what all these codes do to install the Burny 2.5 Plus processor card--- the important thing is to get them written down in the following chart so they can be re-entered in the new control.

The procedure would be to step through the list for each of the AUX entries and write down the data displayed for the block and the TVVFF displays.

While this list contains a maximum of 50 entries, the number of AUX table entries is usually much less. The end of the list is indicated by a display of a location being AVAILABLE. This means that no data has been entered for this table entry—the Burny will not search the table past this AVAILABLE location therefore any data following the first AVAILABLE location is not needed—it would not affect the controls operation in any way.

Begin stepping through the list and write down the data in the following chart:

3.1.1 AUX CODE TABLE DATA

Table location display: Example: AUX01 – M20 – CUT OFF	TVVFF display Example:32005 – M20 – CUT OFF
AUX01 -- --	-- --
AUX02 -- --	-- --
AUX03 -- --	-- --

AUX04	--	--	--	--
AUX05	--	--	--	--
AUX06	--	--	--	--
AUX07	--	--	--	--
AUX08	--	--	--	--
AUX09	--	--	--	--
AUX10	--	--	--	--
AUX11	--	--	--	--
AUX12	--	--	--	--
AUX13	--	--	--	--
AUX14	--	--	--	--
AUX15	--	--	--	--
AUX16	--	--	--	--
AUX17	--	--	--	--
AUX18	--	--		
AUX19	--	--		
AUX20	--	--		
AUX21	--	--		
AUX22	--	--		
AUX23	--	--		
AUX24	--	--		
AUX25	--	--		
AUX26	--	--		
AUX27	--	--		
AUX28	--	--		
AUX29	--	--		
AUX30	--	--		
AUX31	--	--		
AUX32	--	--	--	--
AUX33	--	--	--	--
AUX34	--	--	--	--
AUX35	--	--	--	--
AUX36	--	--	--	--

AUX37	--	--	--	--	
AUX38	--	--			
AUX39	--	--			
AUX40	--	--			
AUX41	--	--			
AUX42	--	--			
AUX43	--	--			
AUX44	--	--			
AUX45	--	--			
AUX46	--	--			
AUX47	--	--			
AUX48	--	--			
AUX49	--	--			
AUX50	--	--			

4. OPTION CODES

All of the Burny 2.5 and related Series 2 controls have various software options that are enabled by special "Lockout" codes based on the serial number of the control. While the new Burny 2.5 Plus card has all "options" now loaded as standard features, the Option Settings for the old board must be documented to determine some of the parameter settings on the new board.

There are two ways that this is done, depending on the age of the software in the existing control.

4.1 Option code display on very old systems.

Very old systems only display the options as a coded text string during power-up. The control will turn on and go through it's normal tests, and then display a text string as:

OPTN- C2D4007000

Each digit in this display references a particular option.

Turn the power Off, and back On to the control, and wait for this string to appear—then record the value in the following spaces (it may take several cycles of power Off/On to get the entire string written down correctly).

OPTN										

4.2 Option code display on newer Burny 2.5 (Series 2) systems

Controls with more recent software will have a display function called DSPY80 which tells the ON/OFF status of each option directly on the screen. Press the DSPY button and select DSPY80. When the ENTER button is pressed, the display will first show a sequence of values showing the serial number, hardware type and how much memory is used. Press the ENTER button during this sequence and the display will change to show:

OPTIONS

KERF --- ON or KERF --- OFF

Pressing enter will step down through this list and show the status of each option as ON or OFF. Record these values in the following chart for later use. Some of these options may not appear in the list since they are now considered "standard"—the chart has locations for them to make the recording process easier

4.2.1 Option ON/OFF status

OPTION NAME	ON/OFF
KERF	
SCALE	
ROTATE	
MIRROR	
PLATE ALIGN	
SERIAL COMM	
COMM ENHANCE	
CAD LINK	
PLATE MARKER	
STD. SHAPES	
TEACH	
KNIFE KERF	
CUSTOM AUX.	
LANGUAGE or individual language such as SPANISH, FRENCH, GERMAN, etc.	
FLOPPY DRIVE	
PRG. FDRT/KRF (programmable feedrate and kerf)	

5. BACKUP PART PROGRAMS

The final section of data that must be transferred from the existing Burny 2.5 to the new Burny 2.5 PLUS card are the stored part programs in the control. Part programs could have been created by either loading a Standard Shape, Template Teach, Downloading a program from the serial port or a Floppy, or creating a program using the Editor.

When the old processor card is removed from the system, these programs will be lost unless they are backed up to some external device. Some customers will already have all of their programs stored on the host computer, so there is no need to backup the data from the Burny 2.5. However, other customers will have programs created by template teach, that are only stored in the Burny 2.5's memory—these programs should be backed up if possible.

This can be done in two ways.

If the system is equipped with a serial port, and the external computing device can accept program uploads, use the STORE function in the Burny 2.5 to store to the RS-232 port and send all the internal programs up to the host computer.

If the system is equipped with an internal or external Floppy Disk drive, use the STORE function in the Burny 2.5 and store the programs to a series of floppy disks so they can be reloaded into the new card.

6. Power Off—Swap processor cards

Now that all the data from the existing Burny 2.5 processor card has either been stored to some external device, or recorded on this document on the lists provided, the old card can be removed, and the new card installed.

IMPORTANT: Remove all sources of AC power to the machine before performing any service work. The main power disconnect should be turned off and Locked in the OFF state to prevent someone from accidentally turning the power back on during the service operation.

WARNING: Proper handling procedures must be followed when installing the new MO-12438 Burny 2.5PLUS processor card. This card contains many high speed, high density electronic devices that can be damaged by STATIC ELECTRICITY caused by improper handling. Before removing the card from it's protective bag, the installing technician MUST use a grounded anti-static wrist strap connected to the machine chassis. All sources of STATIC ELECTRICITY should be removed from the area (any styrofoam, plastic packing material, bubble wrap, plastic paper sleeve protectors, etc). Once the board is removed from it's protective bag, it should be installed directly into the Burny system—do not lay it on a table or other surface that may not be grounded.

**The existing Burny 2.5 processor card should be placed back into the same protective anti-static bag after it is removed from the system. **

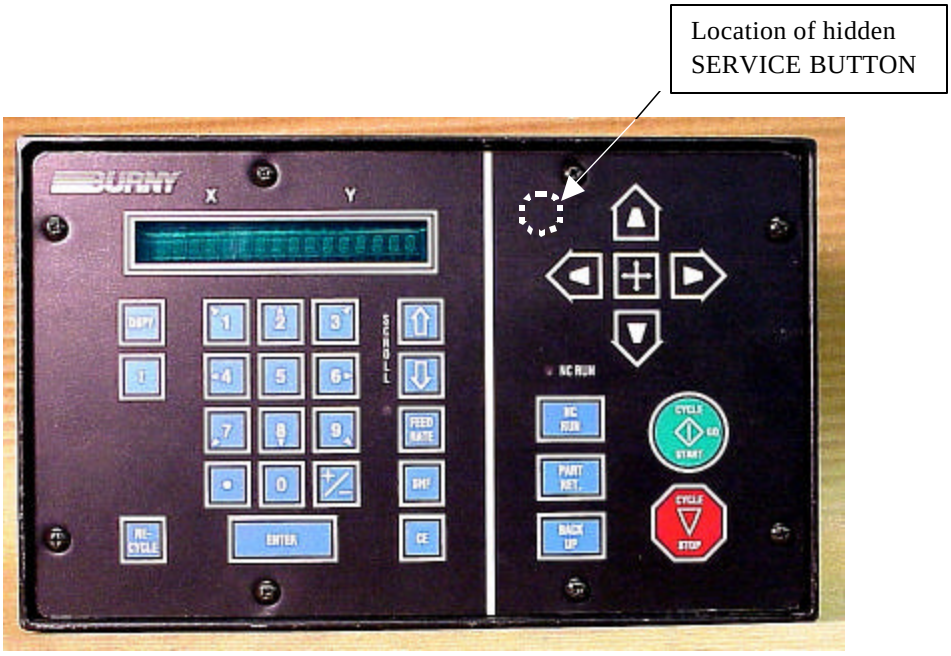


Figure 1- Typical Burny 2.5 Front Panel

Card installation:

1. Remove all sources of AC power to the machine, and lock-out the power disconnect to the machine to prevent accidental re-application of AC power during the service process.

2. Connect a grounded anti-static wrist strap to the machine frame and place it on the wrist of the installing technician.

3. Remove the screws holding the front panel of the product. For the Burny 2.5, these are the 8 screws around the keyboard panel. On the 1250 and 1400, there are 8 to 10 screws holding in the entire front hinged door. And finally, on the Burny 2.8, there are 22 screws holding the entire top cover of the cabinet—remove all but the bottom 4 screws along the lower front edge of the cabinet—just loosen the front 4 screws and lift the lid out of the slotted holes. See Figure 1.

4. Once the screws are removed, lay the front panel open so the screws holding the interface card to the processor card can be accessed.

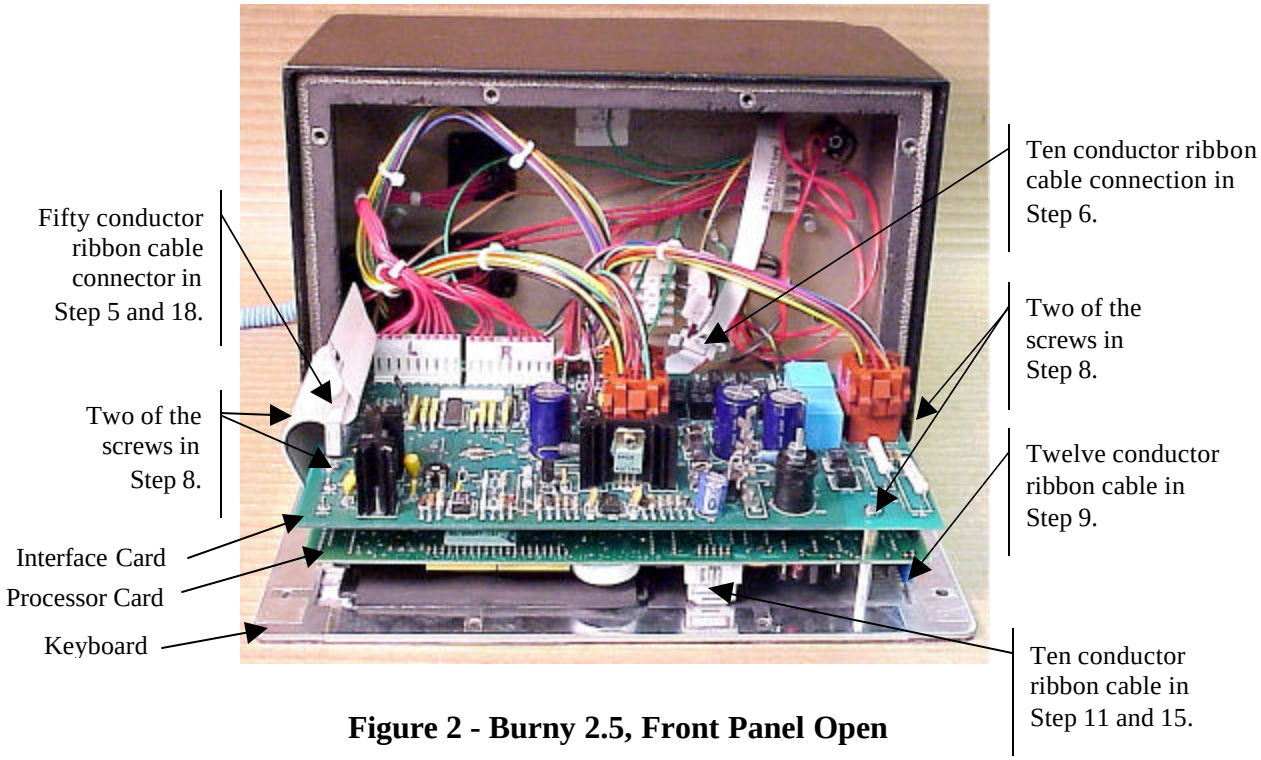


Figure 2 - Burny 2.5, Front Panel Open

5. Unplug the large 50 conductor ribbon cable that runs from the processor card to the interface card. See Figure 2.

6. Disconnect the 10 conductor ribbon cable from the processor card to the RS-232/422 modem. See Figure 2.

7. If installed, unplug the 14 conductor ribbon cable that runs from the processor card to the optional home limit switch input card used on some Burny 2.5 and 2.8 systems. See Figure 3.

8. Remove the 4 screws holding the interface card to the processor card in the system. This will make the interface and the processor card free floating so take care not to drop or stress the wires in the system during

this step. See Figure 2.

9. Lift the processor card slightly away from the keyboard panel, and unplug the 12 conductor ribbon that runs from the keyboard panel to the processor. See Figure 2.

10. Remove the old processor card from the system.

11. Remove the short 10 and/or 14 conductor ribbon cables from the old processor card—these will be re-used with the new card. See Figure 3.

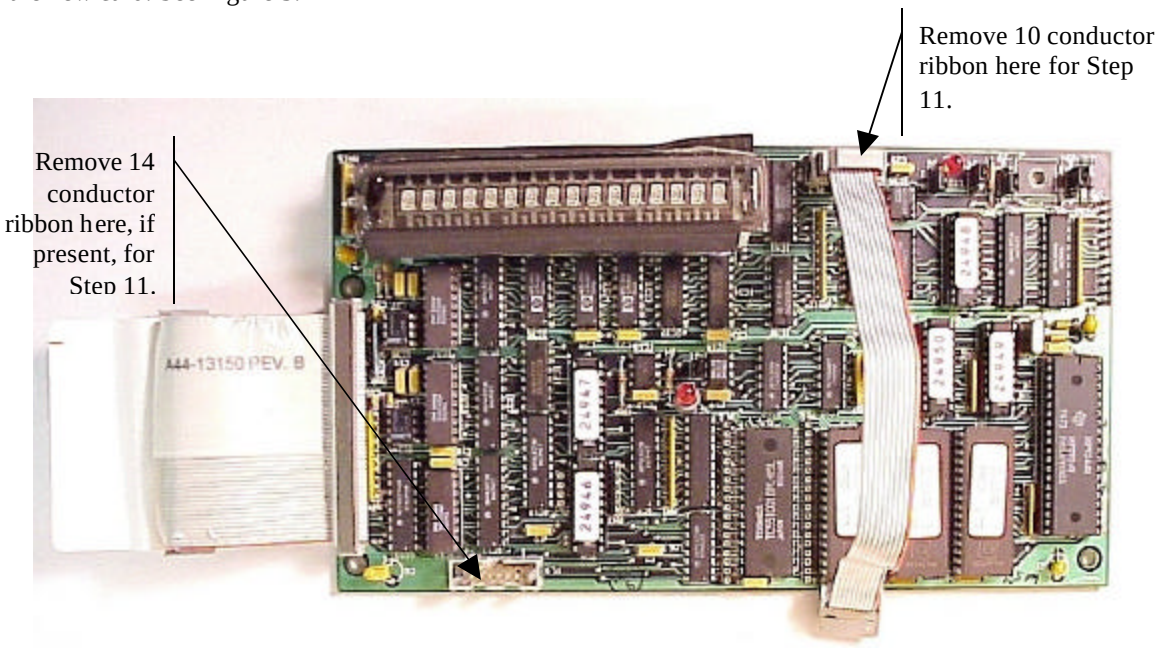


Figure 3 - Burny 2.5 Existing Processor Board

12. If a Burny 2.8 is being updated, remove the old keyboard by removing the 6 screws around the bezel on the front of the unit and discarding the old keyboard. Install the new keyboard supplied with the updated kit using the same screws and bezel as the old panel.

13. If a Burny 2.5 is being updated, discard the old keyboard. Use the new keyboard supplied with the update kit.

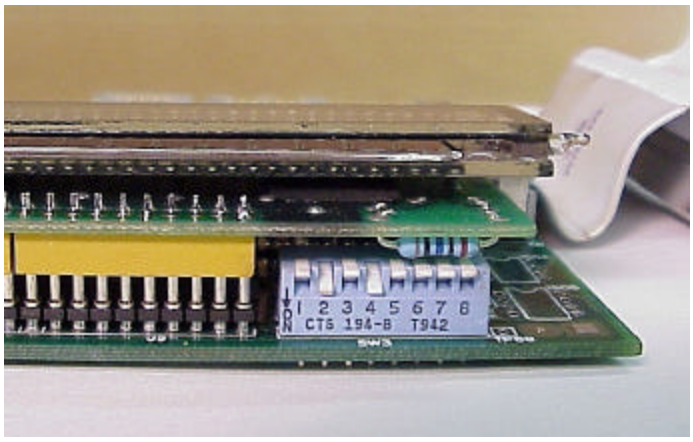


Figure 4 - DIP Switch in Step 14

14. Remove the new MO-12438 processor card from it's protective bag. See Figure 5 and 9. Set the DIP switch located on the new card under the readout as follows:

    - When using the MO-12438 card with any of the Burny 2.5 type keyboards that include the **4 DIRECTIONAL JOG ARROWS,** or with a **Burny 1250** or **Burny 1400** keyboard which also include the jog arrow buttons, the DIP switch on the MO-12438 **MUST** be set as follows:

      Position 1 -- OFF
      Position 2 -- ON
      Position 3 -- OFF
      Position 4 -- ON
      Position 5 -- OFF
      Position 6 -- OFF
      Position 7 -- OFF
      Position 8 -- OFF

      See Figure 4 -- these are the proper jumper settings when used with the new Burny 2.5 Plus front panel.

    - See APPENDIX A for details and precautions for using the MO-12438 card with older style Burny 2.5, 2.8 and private label keyboard panels.

15. Re-connect the 10 and/or 14 conductor ribbon cables to the new processor card—the connectors for these cables are located in almost the exact same location as the old card. Take care that the 10 pin cable for the serial RS-232/422 port is connected to the J4 connector on the new card. There is another 10 pin connector on the new processor card that will be used for software updates—but it will not function for the RS-232 port use. See Figure 5.

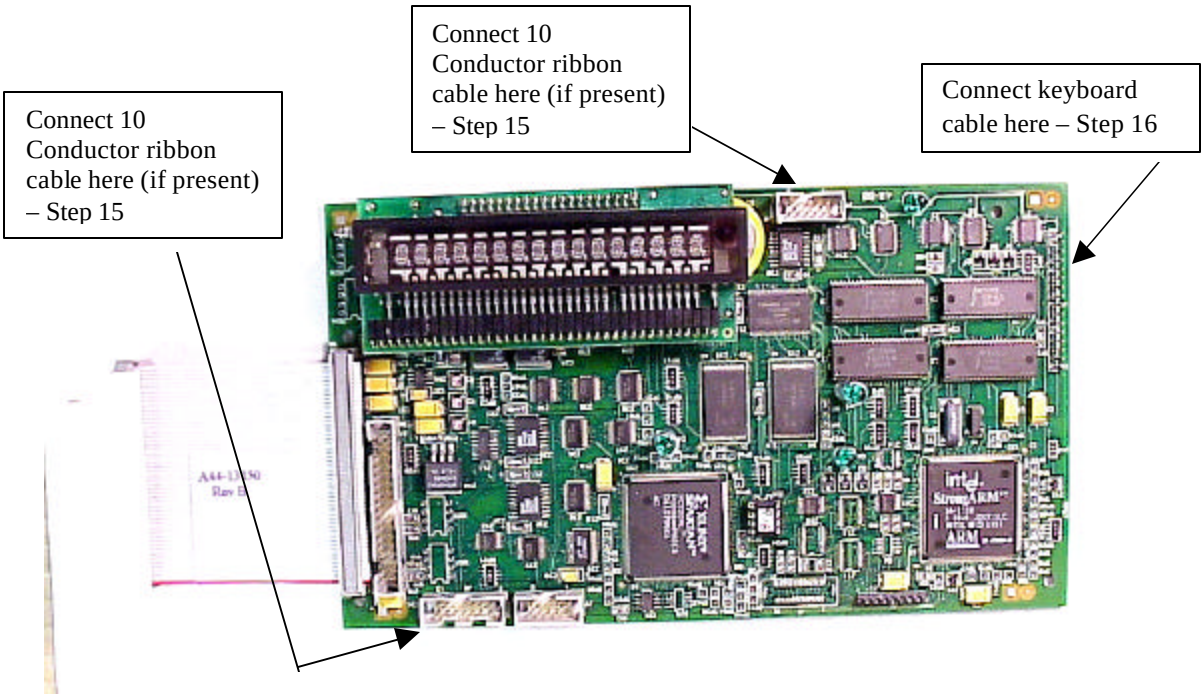


Figure 5 - Front of New Processor Board

16. Place the new MO-12438 card over the keyboard, and connect the ribbon from the keyboard to the J1 connector on the new processor card. Be sure to apply the ribbon connector starting at pin 1 of the J1 connector—the new processor card has some extra pins included in the J1 connector for future expansion—the older keyboards must be connected to the original 12 input pins. Also make sure the 10 or 14 conductor additional ribbon cables are routed under the card properly and are not pinched or interfering with the LED's or other devices.

17. Align the interface card and new processor over the keyboard standoffs, and replace the 4 screws to hold these two boards together.

18. Connect the 10, 14 and 50 conductor ribbon cables to their respective locations in the system. See Figure 2.

19. Replace the keyboard in the cabinet on 2.5 systems, close the door on the 1250/1400 or replace the 2.8's cabinet lid and replace the screws to hold in the panel or door. Make sure all screws are tight to insure a dust tight seal around the opening.

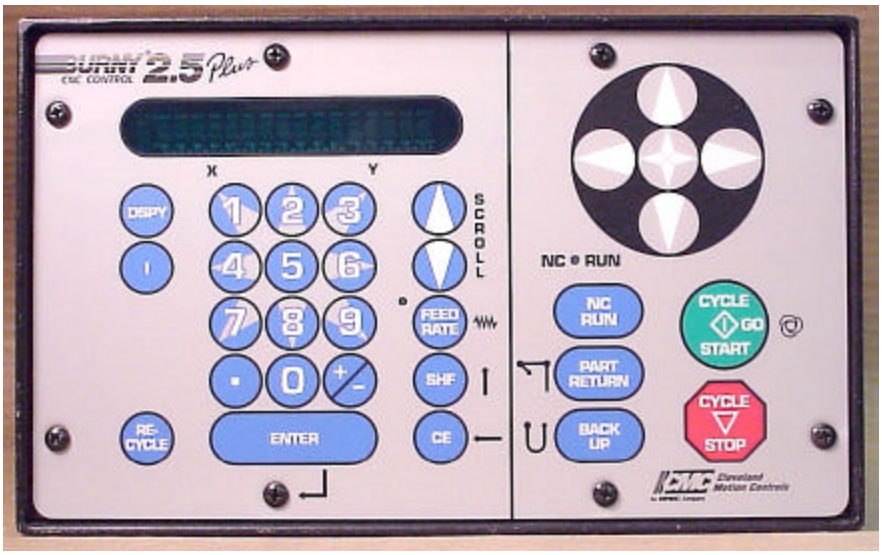


Figure 6 - Burny 2.5 *Plus* Front Panel

20. Remove the wrist strap now that the new card is installed and the cabinet is closed

21. Continue with this procedure to re-install all the data needed to make the new board function on the machine.

7. Power ON – Re-install saved data

Now that the mechanical installation of the new card is complete, the new card must be configured to run the system and act the same as the card that was removed. There will be some changes in the operation of the controls since you are updating the software to the most recent software version as a result of this card exchange. Consult the new Burny 2.5 operation manual supplied with the update kit for details on how to operate the new features.

1. Re-Apply AC power to the cutting machine and turn on the Burny system if there is a separate switch. The control should power up normally and display the familiar READY --- SELECT FUNCTION message.

2. DO NOT enable the servo drives for the system. If possible, disengage the pinion gears from the drive rack so that the machine. This is done as a precaution until it is confirmed that the parameters are working correctly in the new system.

3. Verify that the keyboard works properly. Try several operations to verify that most of the keys work correctly.

4. Press the hidden SERVICE button and select the SERV52- MEM RESET. Press ENTER and answer YES to both prompts to reset the program storage memory. After the process is done, use the DSPY80 function to display the amount of memory Used and Available. There should be almost 512K bytes available—this is the standard memory size on the MO-12438 Burny 2.5 Plus processor card.

5. Press the hidden SERVICE button and access the SERV10 parameter list. GO back to section 2.1.1 of this document and enter all the parameters in the SERV10 list. ALL PARAMETERS must be entered into the new card—do not skip any of the entries. If a value was not found in the old card, there is a suggested DEFAULT value in the table that should be entered into the new card. After the system is running, these new parameters may need to be re-adjusted to give optimal machine performance—see the new manual shipped with the update for details on the new parameter settings.

SPECIAL REQUIREMENTS FOR OLDER SYSTEMS

If the MO-12438 is being used to replace the older MO-03370, MO-4873, or MO-04875 processor cards—see APPENDIX B for information regarding the encoder scaling jumpers on these old cards, and how it affects the setup parameters

6. Refer back to Section 4 of this document where the OPTIONS from the old board were recorded. All of the features that used to be referred to as OPTIONS are now all STANDARD features in the Burny 2.5 Plus—there are no special option codes to enter. However, 2 of these old OPTION capabilities require a setting of one of the setup parameters to either ENABLE or DISABLE the feature.

COMM ENHANCE OPTION

Parameter SD51 now has a bit to control the COMM ENHANCE OPTION. This is an 8 digit parameter--for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the COMM ENHANCE option was ON with the old board, set digit D3 of the SD51 parameter to 0. (xx0xxxxx). This will cause the COMM ENHANCE to function on the new card.

- If the COMM ENHANCE option was OFF with the old board, set digit D3 of parameter SD51 to an "8" to disable the COMM ENHANCE feature on the new board— (xx8xxxxx).

KNIFE KERF OPTION

Parameter SD63 now has a bit to control the KNIFE KERF OPTION. Knife kerf is a special mode for the kerf routine that is used by the sign making industry for the special requirements of the drag knife used for cutting vinyl material, or for router cutting of plastic and aluminum for signs.

This is an 8 digit parameter-- for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the KNIFE KERF option was ON with the old board, set digit D3 of the SD63 parameter to a 1. (xx1xxxxx). This will cause the KNIFE KERF to function on the new card.

- If the KNIFE KERF option was OFF with the old board, set digit D3 of parameter SD51 to an "0" to disable the KNIFE KERF feature on the new board— (xx0xxxxx).

7. Press the hidden SERVICE button again, and access the SERV41 overlay table list. Go back to section 2.2.1 of this document and re-enter all the parameters saved from the SERV41 list in the old control.

8. Press the hidden SERVICE button again, and access the SERV42 overlay table list. Go back to section 2.3.1 of this document and re-enter all the parameters saved from the SERV42 list in the old control.

9. Press the hidden SERVICE button again, and access the SERV43 overlay table list. Go back to section 2.4.1 of this document and re-enter all the parameters saved from the SERV43 list in the old control.

10. Press the hidden SERVICE button again, and access the SERV44 overlay table list. Go back to section 2.5.1 of this document and re-enter all the parameters saved from the SERV44 list in the old control.

11. Press the hidden SERVICE button again, and access the SERV45 overlay table list. Go back to section 2.6.1 of this document and re-enter all the parameters saved from the SERV45 list in the old control.

12. Press the hidden SERVICE button and perform the SERV97 procedure to store the new parameters so they will not be lost when the power is turned off.

13. Press the hidden SERVICE button and select the SERV51-SPD CAL function—press ENTER to select the function, but DO NOT follow the prompts on the screen regarding the CYCLE START button. Instead, press the hidden SERVICE button again, and now select the SERV97 function and store the cleared speed calibration data.

14. Press the hidden SERVICE button and access the SERV78-CUSTOM AUX code conversion table. Go back to section 3.1.1 and re-enter all the data saved for the Custom AUX table from the old control. The procedure would be to press the ENTER button to get to the next AUX location, then press ENTER again to access the TVVFF entry screen. Enter the TVVFF code saved from the old control (32005) and press ENTER. You can scroll back to a previous entry to check it if desired.

15. The control should now be operational. Turn on the servo drives and test the motion of the machine. See the manual that came with this update kit for details on the new setup parameters for help in adjusting the machine's performance.

8. Appendix A – DIP Switch settings for older Burny 2.5 Front Panels

Older front panels for the Burny 2.5, as well as several of the private labeled versions did not include the 4 Directional JOG ARROWS as shown in the pictures. These panels used a sequence of pressing the II button, then used the numbered keyboard to select the jog direction.

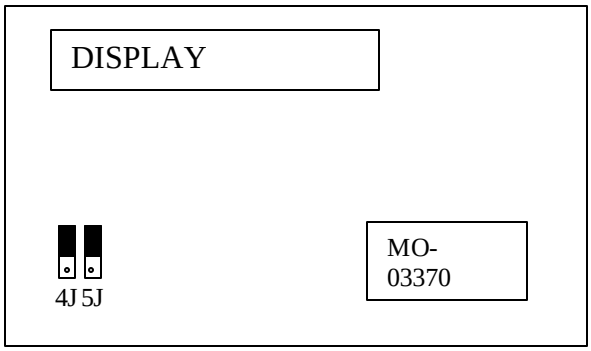
To configure the new MO-12438 board to work correctly with these older panels, the DIP switches must be set to match the configuration jumpers from the old boards.

DIP switch settings for MO-03370 processor card replacement

SW1 – ON
SW2 – OFF
SW3 – OFF
SW4 – Set to ON if Jumper 4J is set AWAY from the display.
Set to OFF if Jumper 4J is set TOWARD the display.

SW5 – Set to ON if Jumper 5J is set AWAY from the display.
Set to OFF if Jumper 5J is set TOWARD the display.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-04873 or MO-04875 processor card replacement

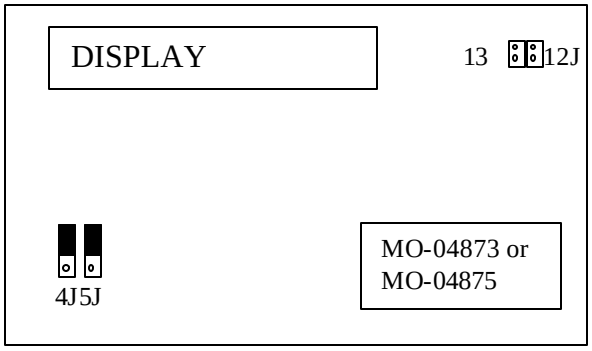
SW1 – ON
SW2 – Set to OFF if Jumper 12J is missing,
Set to ON if jumper J12 is installed

SW3 – Set to OFF if Jumper 13J is missing,
Set to ON if jumper J13 is installed

SW4 – Set to ON if Jumper 4J is set AWAY from the readout.
Set to OFF if Jumper 4J is set TOWARD the readout.

SW5 – Set to ON if Jumper 5J is set AWAY from the readout.
Set to OFF if Jumper 5J is set TOWARD the readout.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-08601 or MO-11249 processor card replacement

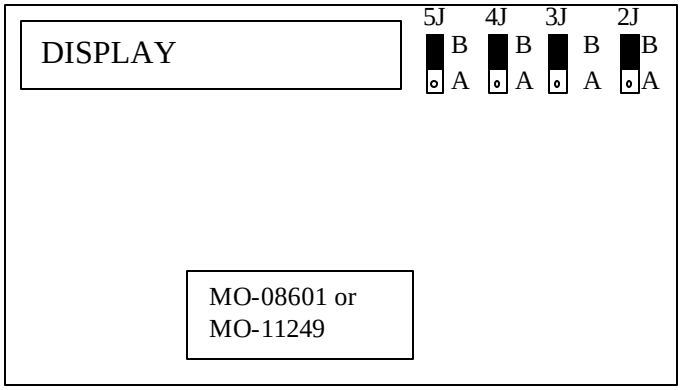
SW1 – ON
SW2– Set to OFF if Jumper J2 is set to “A”,
Set to ON if Jumper J2 is set to “B”

SW3– Set to OFF if Jumper J3 is set to “A”,
Set to ON if Jumper J3 is set to “B”

SW4– Set to OFF if Jumper J4 is set to “A”,
Set to ON if Jumper J4 is set to “B”

SW5– Set to OFF if Jumper J5 is set to “A”,
Set to ON if Jumper J5 is set to “B”

SW6, SW7, SW8 – All set to OFF



9. Appendix B – Changes to Encoder Scaling for older 2.5 updates

The older MO-03370, MO-04873 and MO-04875 processor cards included hardware jumpers J6 thru J9 on the card. These were used to tolerate faster encoder counting frequencies that could not be handled by the hardware. The newer 2.5 processor cards use faster encoder counting circuitry and eliminated these jumpers.

If one of these older boards (3370,4873,4875) are being replaced, the setting of these jumpers can affect the parameters entered into the new MO-12438 card.

If all 4 of the jumpers J6,J7,J8 and J9 are set toward the display (See Fig. 1), then the setup parameters from the old board can be directly entered into the new card.

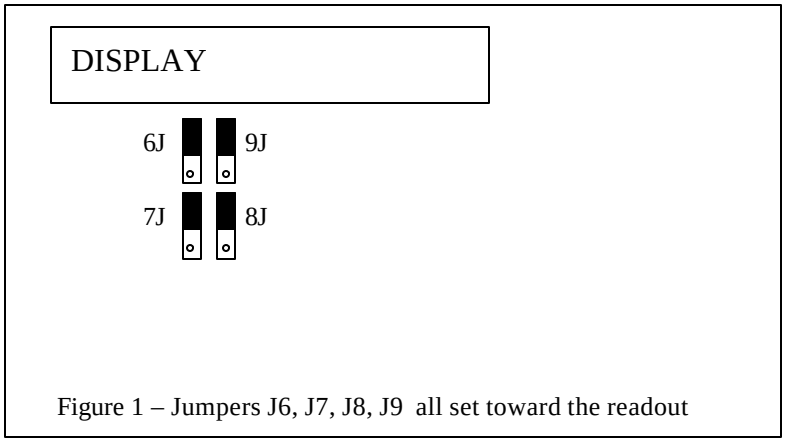


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

Some installations may be using faster encoders, particularly motor mounted encoders, and may have these jumpers set the opposite direction. If all 4 of the jumpers J6,J7, J8, J9 (Figure 2) are set away from the DISPLAY, then the value recorded for parameter SD22- ENC LINES/REV must be multiplied by 4. So for example, a system where the old card had a setting of 500 for SD22 would need to have 2000 entered into the new MO-12438 to work properly.

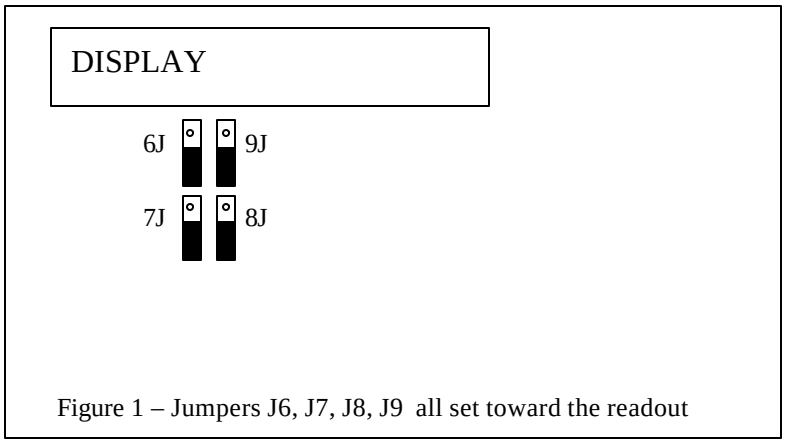


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

If the old system has jumpers J6, J7, J8, J9 set to any other random pattern, contact the factory since this will require modifying several of the system parameters. This is very uncommon.

10. Appendix C "Burny 2.5 Plus-- New features and Capabilities"

The goal of the 2.5 Plus development program was to produce a new version of the computer board in the Burny 2.5 series products that would improve the speed and system performance, without affecting the basic operation. The 2.5 Plus processor card will perform RS-232 downloads, and the Kerf calculations 80-90% faster than the older cards.

Most of the prompting, displays and operator inputs are exactly the same as the older cards—so there is little or no re-training required when the new 2.5 Plus card is substituted for an older card. However, there is the problem that the 2.5 Plus basically copies the operation of the Burny 2.5 software that was in existence at the end of 1999. If the older 2.5 card had software dating back many years (could go back as far as 1988), then there will be substantial differences in the machine's operation due to the changes and improvements that have occurred over the years of software development on the Burny 2.5 product line. This may require some additional training for the operators to become familiar with the new operation of the control, and the new capabilities available to the operator. See the new OPERATION MANUAL supplied along with this Burny 2.5 Plus product for details on all the current features of the product.

The two main areas where a difference will be noted are in the Serial I/O downloading speeds, and the Kerf processing speed.

Kerf Processing speed

The Kerf process is self contained within the Burny 2.5 Plus—there is no interaction with the outside world so the process can function at peak efficiency.

Serial I/O Downloading Speed

The Serial I/O downloading is a different matter. Since the Serial I/O communication via the RS-232/422 port connects to devices outside the Burny product, the performance of the downloading system is very dependent on the performance and setting of the external devices. For example, if the existing cutting machine had the BAUD rate set to 2400 Baud for the serial downloading speed, there will be NO increase in performance of the Serial Downloading speed with the Burny 2.5 Plus—the older card work just as well at 2400 baud as the new 2.5 Plus card. To fully take advantage of the new downloading speed capacity of the Burny 2.5 Plus card, the external system must be capable of supplying the data faster also. The following is an ESTIMATE of the speed improvement expected for various Baud rate settings of the Burny 2.5 Plus. Note that the higher baud rate settings were not even possible with the older Burny 2.5 which was normally used up to about 4800 baud.

Serial I/O Downloading Baud Rate setting	ESTIMATED speed improvement with Burny 2.5 Plus.
300 to 2400 Baud	0%-- Same speed as older card
4800 Baud	25% Less time for download
9600 Baud	60% Less time for download
19.2K Baud	80% Less time for download
28.8K Baud	80% Less time for download
38.4K Baud	75% Less time for download
57.6K to 230K Baud	60-75% Less time—note that these very high baud rates require more system overhead and are actually LESS EFFICIENT than the somewhat slower settings from 19.2K to 38.4K Baud

Serial Number and Option codes

The Burny 2.5 Plus software does not use Option codes—all possible features for the product are available as Standard capabilities with every system that ships. Similarly, there is no longer a SERIAL NUMBER imbedded into the product—the display will show " SERIAL 0" for all Burny 2.5 Plus products. The main purpose for the Serial number was to control the software lockout codes for the options—no more options means no more serial number.

The fact that all Options are now standard will cause some new menus and displays to show up on older controls where a particular option was missing before. For example, if an older Burny 2.8 did not have the STANDARD SHAPES option installed, there would not have been a menu choice for "LOAD-STANDARD SHAPE" in the select function list. When the 2.5 Plus card is installed, the operator will now see this "LOAD- STANDARD SHAPE" prompt – this should be explained to the operator ahead of time to avoid possible confusion.

The following is a list of the features that will now appear on all controls—the ones marked ** may have been missing from the older card—they are now provided as a standard capability of the new Burny 2.5 Plus software:

- RUN- PROGRAM
- LOAD- FROM STD SHAPE ** (Older card required Standard Shape option to be enabled)
- LOAD- FROM RS-232 ** (Older card required Serial I/O Option to be enabled)
- STORE- TO RS-232 ** (Older card required Serial I/O Option to be enabled)
- TEACH- PROGRAM ** (Older card required Teach Option to be enabled)
- DELETE-PROGRAM
- EDIT-PROGRAM ** (Very old cards could only access EDIT via DSPY20-)
- LOAD- FROM FLOPPY ** (Older cards required Floppy option to be enabled)
- STORE- TO FLOPPY ** (Older cards required Floppy option to be enabled)
- LOAD/RUN- RS-232 ** (Older cards required Serial I/O option to be enabled)
- LOAD/RUN-FLOPPY ** (Older cards required Floppy option to be enabled)

Some operators may complain that they have to Scroll through too many choices in this new expanded list of features to get what they want. Remember that these choices can be made with a single button push as described in the operation manual— as a reminder, the following number keys select the indicted function:

- RUN- PROGRAM -- Press the number 1 on the keypad
- LOAD- FROM STD SHAPE -- Press the number 2 on the keypad
- LOAD- FROM RS-232 -- Press the number 3 on the keypad
- STORE- TO RS-232 -- Press the number 4 on the keypad
- TEACH- PROGRAM -- Press the number 5 on the keypad
- DELETE-PROGRAM -- Press the number 6 on the keypad
- EDIT-PROGRAM -- Press the number 7 on the keypad
- LOAD- FROM FLOPPY -- Press the number +/- on the keypad
- STORE- TO FLOPPY -- Press the number . (decimal point) on the keypad
- LOAD/RUN- RS-232 -- Press the number 3, then the SHF on the keypad
- LOAD/RUN-FLOPPY -- Press the +/- key, then the SHF on the keypad

Blank

Burny 2.5 PLUS Update

Installation instructions for field upgrades using the Burny 2.5 PLUS processor card.

Also for use with MO-12685 and MO-12742 upgrade kits

ECO REVISION HISTORY

Revision	*Description*	*ECO*	*Date*
-AA	Written	---	28-July-00
-BA	Add photos, DIP Switch and parameter for old cards	CLE1716	07-Dec-00

Spec No.:	*Division:* BURNY
Author: RDM	*Rev:* **BA**
File name: AO-90177BA.doc	*Date:* **7-Dec-2000**

Cleveland Motion Controls
An IMC Company

REVISION HISTORY

Rev AA	RDM (28-July-2000) -- Written
Rev BA	JRB (7-Dec-2000) -- Added retrofit Figures and references
	RDM(7-Dec-2000) -- Add APPENDIX A,B for Dip switch settings for older front panels, and APPENDIX B for modifications needed to Encoder Scaling parameters when MO-3370 or 4873 or 4875 board was replaced.

TABLE OF CONTENTS

1. INTRODUCTION

These instructions document the steps needed to update existing Burny 2.5 controls, or any of the other Series 2 controls (1250,1400, 2.8, 2.9) with the new MO-12438 Burny 2.5 Plus processor card. The procedure assumes the installer is familiar with the Burny products and is capable of the mechanical assembly/disassembly and entry of parameters into the system.

For updates on a Burny 1250 or Burny 1400 system, the original keyboard can still be used—just the processor card is replaced as described in the following procedures.

For Burny 2.5, Burny 2.8 or Burny 2.9 systems, a special part number MO-12685 has been created to provide a new processor card with the new 2.5 Plus keyboard. This is necessary since the older Burny 2.5 keyboards do not have the proper clearance in the aluminum panel for the current readout used on the Burny 2.5 products. By ordering this MO-12685 kit, the installer is assured of having a panel that works fits the readout.

The main purpose of this particular procedure is to document all of the stored parameters, option codes, Aux code conversion tables, etc. which are configured in the existing Series 2 control BEFORE the new processor card is installed. Once the new card is operational, this stored data from the old system will be re-entered with the goal of making the new card capable of running the machine in as little time as possible.

2. PARAMETER and SYSTEM DATA RETRIEVAL

Before disassembling anything, the installer must first retrieve all the data stored in the existing Burny 2.5 system. There is no automatic way to do this with the older software, therefore the data must be manually obtained. The following pages have procedures and tables to be used to write down the parameter data, Code Conversion table data, and options enabled in the current system. Then, after the new processor card and panel are installed, these values must be manually re-entered into the new system. If this process is done correctly, and attention is paid to getting the data correct, the new system should begin operation with no further tuning required.

2.1 System Data Parameters-SERV10

With the existing system operating normally, press the hidden "SERVICE" button and access SERV10-SYS DATA. Press ENTER to display the main system parameter list. The display shows the first parameter as:

SD01-ARC ON DELAY

Press the ENTER button a second time to display the value currently set for this parameter—if the Arc On delay had been set for 3 seconds, the display would now show:

AONDLY = 3.00

Write down this 3.00 value in the following table. Press the ENTER button to access the next parameter name, and then press the ENTER button a second time to access the value—the display would have showed:

SD02-BLEEDOFF then BLEDOF= 2.00 (2 seconds used for this example)

Continue stepping through the entire list of parameters and write their values in the able provided.

IMPORTANT: Older systems may not include all the parameters shown on this list.

Older systems had less parameters than the current Burny 2.5—therefore it is important to carefully pay attention to the parameter number displayed on the screen, and match it to the table before writing the value. Any parameters that were not included in the old system will be handled during the installation portion for the new card.

2.1.1 SERV10 PARAMETERS

Parameter Number and Name	PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN	Default value to be used for older systems where a parameter was not part of the older products list.	Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system
SD01- ARC ON TIME	ARCDLY =		
SD02- BLEEDOFF	BLEDOF =		
SD03- ACCEL TIME	ACCTME =		
SD04- MAX DRV SPD	MAXSPD =		
SD06- BACKUP SPD	BCKSPD =		
SD07- CORNER SPD	CORSPD =		
SD08- MIN HLD SPD	MINHLD =		
SD09- ERR SPD MAX	ERRSPD =	20 inch/min 400 mm/min	

SD10- RUNSPD LIMIT	RUNLMT =		
SD11- TRAVERS LMT	TRVLMT =		
SD12- MIN ACCEL	MIN ACCEL =	.20 seconds	
SD14- GAIN BREAK	GAIN BREAK =	0	
SD15- ERR WRN DST	WRNDST =		
SD16- LOOP GAIN	LPGAIN =		
SD17- ARC OFF DLY	AOFDLY =	2.0 seconds	
SD18- SLWDWN DIST	SLWDST =		
SD19- DISABL DIST	DISABL =	.25 inches 6.3 mm	
SD20- X ENC DIST	XENSCL =		
SD21- Y ENC DIST	YENSCL =		
SD22- ENC LIN/REV	ENC LINES =		
SD23- X ENC DIR	X ENC DIR -		
SD24- Y ENC DIR	Y ENC DIR -		
SD25- X DRV DIR	X DRV DIR -		
SD26- Y DRV DIR	Y DRV DIR -		
SD27- PLATE SIDE	PLATE ON -		
SD28- HEIGHT RLY	CONTACT -		
SD29- SLWDWN RAD	SLWRAD =		
SD30- MIN RAD SPD	MRADSP =	30 inches/min 150 mm/min	
SD31- PLASMA TB1	PLASMA TB1 =	NO	
SD32- MIN SLW ANG	MINSLW =	10	
SD33- MAX SLW ANG	MAXSLW =	22	
SD40- X MARK OFF	XOFST1 =		
SD41- Y MARK OFF	YOFST1 =		
SD42- MARKER SPD	MRKSPD =		
SD43- MARK DELAY	MRKDLY =		
SD45- DEFLT DWELL	DFDWEL =		
SD46- MIN OFF DWL	MINOFF =		
SD47- XOFST2	XOFST2 =		

SD48- YOFST2	YOFST2=		
SD49- START DELAY	STRDLY =	1.5 seconds	
SD50- SERIAL DEFN	SERIAL DEFN =		
SD5- PRGM FORMAT	PGMFMT =		
SD52- SPECIAL EOP	EOP 1 =		
SD53- FILE EXTEN	FEXTEN =	434E4300	
SD60- OPER SYS	OPER SYS =		
SD61- SYS CONFG 1	SYSCFG1 =		
SD62- SYS CONFG 2	SYSCFG2 =		
SD63- SYS CONFG 3	SYSCFG3 =	0	
SD65- OVERLAY CFG	OVERLAY CFG =	0	
SD68- SPEED RANGE	SPEED RANGE =	4	
SD69- LA NGUAGE	LANGUAGE =	0	
SD70- KNF ROT DIA	KNFDIA =		
SD71- KNF B.P. ANG	KNF B.P. ANG =		
SD74- T2XHOM	T2XHOM =		
SD75-T2YHOM	T2YHOM =		
SD76- T3XHOM	T3XHOM =		
SD77- T3YHOM	T3YHOM =		
SD78- T4XHOM	T4XHOM =		
SD79- T4YHOM	T4YHOM =		
SD80- XOFST1	XOFST1 =		
SD81- XOFST1	YOFST1 =		
SD82- XOFST2	XOFST2 =		
SD83- XOFST2	YOFST2 =		
SD84- XOFST3	XOFST3 =		
SD85- XOFST3	YOFST3 =		
SD86- XOFST4	XOFST4 =		
SD87- XOFST4	YOFST4 =		
SD88- XOFST5	XOFST5 =		

SD89- XOFST5	YOFST5 =		
SD90- XOFST6	XOFST6 =		
SD91- XOFST6	YOFST6 =		
SD92- XOFST7	XOFST7 =		
SD93- XOFST7	YOFST7 =		
SD94- XOFST8	XOFST8 =		
SD95- XOFST8	YOFST8 =		
SD96- XHOMSW	XHOMSW =		
SD97- XHOMSW	YHOMSW =		
SDA0- XBKLSH	XBKLSH =	0	
SDA1- YBKLSH	YBKLSH =	0	
SDA2- LSH RATE	LSH RATE =		
SDD0- SYNC W-AXIS	SYNC ENABLE =	NO	
SDD1- W GAIN	W GAIN =		
SDD2- SKEW LIMT	SKWLMT =		
SDD3- W MAX SPD	WMXSPD =		
SDD4- W ENC DIR	W ENCODER =		
SDD5- W DRV DIR	W DRIVE =		
SDD6- WBKLSH	WBKLSH =		
SDD7 – W OFFSET	WOFSET =		

2.2 System Overlay Table #1 Parameters - SERV41

Burny 2.5 systems built after 1983 had the 5 sets of additional setup parameters which could be selected by programming codes within a part program to "overlay" the standard SERV10 parameter list. Access this list of values by pressing the hidden "SERVICE" button and access SERV41-TB 1 DATA. Press ENTER to display the overlay table #1 list. Note this list is much shorter than the SERV10 list. Again, carefully step down through the list and write the values in the following list:

2.2.1 SERV41 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
1-03- ACCEL TIME	ACCTME =		
1-07- CORNER SPD	CORSPD =		
1-10- RUNSPD LIMIT	RUNLMT =		
1-12- MIN ACCEL	MIN ACCEL =		
1-14- GAIN BREAK	GAIN BREAK =		
1-16- LOOP GAIN	LPGAIN =		
1-18- SLWDWN DIST	SLWDST =		
1-19- DISABL DIST	DISABL =		
1-29- SLWDWN RAD	SLWRAD =		
1-30- MIN RAD SPD	MRADSP =		
1-32- MIN SLW ANG	MINSLW =		
1-33- MAX SLW ANG	MAXSLW =		
1-45- DEFLT DWELL	DFDWEL =		
1-46- MIN OFF DWL	MINOFF =		
1-49- START DELAY	STRDLY =		

2.3 System Overlay Table #2 Parameters - SERV42

Continue with this process to access the data in Overlay Table #2 by pressing the hidden "SERVICE" button and access SERV42-TB 2 DATA. Press ENTER to display the overlay table #2 list.

2.3.1 SERV42 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
2-03- ACCEL TIME	ACCTME =		
2-07- CORNER SPD	CORSPD =		
2-10- RUNSPD LIMIT	RUNLMT =		
2-12- MIN ACCEL	MIN ACCEL =		
2-14- GAIN BREAK	GAIN BREAK =		
2-16- LOOP GAIN	LPGAIN =		
2-18- SLWDWN DIST	SLWDST =		
2-19- DISABL DIST	DISABL =		
2-29- SLWDWN RAD	SLWRAD =		
2-30- MIN RAD SPD	MRADSP =		
2-32- MIN SLW ANG	MINSLW =		
2-33- MAX SLW ANG	MAXSLW =		
2-45- DEFLT DWELL	DFDWEL =		
2-46- MIN OFF DWL	MINOFF =		
2-49- START DELAY	STRDLY =		

2.4 System Overlay Table #3 Parameters - SERV43

Continue with this process to access the data in Overlay Table #3 by pressing the hidden "SERVICE" button and access SERV43-TB 3 DATA. Press ENTER to display the overlay table #3 list.

2.4.1 SERV43 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
3-03- ACCEL TIME	ACCTME =		
3-07- CORNER SPD	CORSPD =		
3-10- RUNSPD LIMIT	RUNLMT =		
3-12- MIN ACCEL	MIN ACCEL =		
3-14- GAIN BREAK	GAIN BREAK =		
3-16- LOOP GAIN	LPGAIN =		
3-18- SLWDWN DIST	SLWDST =		
3-19- DISABL DIST	DISABL =		
3-29- SLWDWN RAD	SLWRAD =		
3-30- MIN RAD SPD	MRADSP =		
3-32- MIN SLW ANG	MINSLW =		
3-33- MAX SLW ANG	MAXSLW =		
3-45- DEFLT DWELL	DFDWEL =		
3-46- MIN OFF DWL	MINOFF =		
3-49- START DELAY	STRDLY =		

2.5 System Overlay Table #4 Parameters - SERV44

Continue with this process to access the data in Overlay Table #4 by pressing the hidden "SERVICE" button and access SERV44-TB 4 DATA. Press ENTER to display the overlay table #4 list.

2.5.1 SERV44 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
4-03- ACCEL TIME	ACCTME =		
4-07- CORNER SPD	CORSPD =		
4-10- RUNSPD LIMIT	RUNLMT =		
4-12- MIN ACCEL	MIN ACCEL =		
4-14- GAIN BREAK	GAIN BREAK =		
4-16- LOOP GAIN	LPGAIN =		
4-18- SLWDWN DIST	SLWDST =		
4-19- DISABL DIST	DISABL =		
4-29- SLWDWN RAD	SLWRAD =		
4-30- MIN RAD SPD	MRADSP =		
4-32- MIN SLW ANG	MINSLW =		
4-33- MAX SLW ANG	MAXSLW =		
4-45- DEFLT DWELL	DFDWEL =		
4-46- MIN OFF DWL	MINOFF =		
4-49- START DELAY	STRDLY =		

2.6 System Overlay Table #5 Parameters - SERV45

Continue with this process to access the data in Overlay Table #5 by pressing the hidden "SERVICE" button and access SERV45-TB 5 DATA. Press ENTER to display the overlay table #5 list.

2.6.1 SERV54 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
5-03- ACCEL TIME	ACCTME =		
5-07- CORNER SPD	CORSPD =		
5-10- RUNSPD LIMIT	RUNLMT =		
5-12- MIN ACCEL	MIN ACCEL =		
5-14- GAIN BREAK	GAIN BREAK =		
5-16- LOOP GAIN	LPGAIN =		
5-18- SLWDWN DIST	SLWDST =		
5-19- DISABL DIST	DISABL =		
5-29- SLWDWN RAD	SLWRAD =		
5-30- MIN RAD SPD	MRADSP =		
5-32- MIN SLW ANG	MINSLW =		
5-33- MAX SLW ANG	MAXSLW =		
5-45- DEFLT DWELL	DFDWEL =		
5-46- MIN OFF DWL	MINOFF =		
5-49- START DELAY	STRDLY =		

3. Retrieving Custom Aux Table Data – SERV78

The Burny 2.5 has the ability to convert the M and G or ESSI auxiliary functions in a part program into the functional codes needed by the Burny to cut the part. The data for making this conversion is contained in a list accessed by pressing the hidden "SERVICE" button, and then selecting the SERV78-CUSTOM AUX utility. Press ENTER to access the first entry in the list. There are 2 display formats used with this list—when the table is first accessed, the display will be in the "Table position" mode which shows which of the 50 possible entries is being displayed, and the current setting for that table location:

AUX01-M20-CUTOFF

This indicates that the first table location "AUX01" contains the data to convert an M20 code from a word address program into an internal Cut Off function—turn the oxygen or plasma off at the end of a cut.

Pressing ENTER at this point changes the display to show the TVVFF code for the AUX01 entry—the display will appear as:

32005-M20-CUTOFF

The 32005 is the TVVFF code:

T -- a single digit that defines the type of code begin converted (1-ESSI, 2-G code, 3-M code)

VV – a 2 or 3 digit value (up to 127) that defines the numeric value for the code (20 in this example)

FF – a 2 digit code defining the internal function assigned to the code (see Burny 2.5 manual for the list)

It is NOT necessary to understand what all these codes do to install the Burny 2.5 Plus processor card--- the important thing is to get them written down in the following chart so they can be re-entered in the new control.

The procedure would be to step through the list for each of the AUX entries and write down the data displayed for the block and the TVVFF displays.

While this list contains a maximum of 50 entries, the number of AUX table entries is usually much less. The end of the list is indicated by a display of a location being AVAILABLE. This means that no data has been entered for this table entry—the Burny will not search the table past this AVAILABLE location therefore any data following the first AVAILABLE location is not needed—it would not affect the controls operation in any way.

Begin stepping through the list and write down the data in the following chart:

3.1.1 AUX CODE TABLE DATA

Table location display: Example: AUX01 – M20 – CUT OFF	TVVFF display Example:32005 – M20 – CUT OFF
AUX01 -- --	-- --
AUX02 -- --	-- --
AUX03 -- --	-- --

AUX04	--	--	--	--
AUX05	--	--	--	--
AUX06	--	--	--	--
AUX07	--	--	--	--
AUX08	--	--	--	--
AUX09	--	--	--	--
AUX10	--	--	--	--
AUX11	--	--	--	--
AUX12	--	--	--	--
AUX13	--	--	--	--
AUX14	--	--	--	--
AUX15	--	--	--	--
AUX16	--	--	--	--
AUX17	--	--	--	--
AUX18	--	--		
AUX19	--	--		
AUX20	--	--		
AUX21	--	--		
AUX22	--	--		
AUX23	--	--		
AUX24	--	--		
AUX25	--	--		
AUX26	--	--		
AUX27	--	--		
AUX28	--	--		
AUX29	--	--		
AUX30	--	--		
AUX31	--	--		
AUX32	--	--	--	--
AUX33	--	--	--	--
AUX34	--	--	--	--
AUX35	--	--	--	--
AUX36	--	--	--	--

AUX37	--	--	--	--	
AUX38	--	--			
AUX39	--	--			
AUX40	--	--			
AUX41	--	--			
AUX42	--	--			
AUX43	--	--			
AUX44	--	--			
AUX45	--	--			
AUX46	--	--			
AUX47	--	--			
AUX48	--	--			
AUX49	--	--			
AUX50	--	--			

4. OPTION CODES

All of the Burny 2.5 and related Series 2 controls have various software options that are enabled by special "Lockout" codes based on the serial number of the control. While the new Burny 2.5 Plus card has all "options" now loaded as standard features, the Option Settings for the old board must be documented to determine some of the parameter settings on the new board.

There are two ways that this is done, depending on the age of the software in the existing control.

4.1 Option code display on very old systems.

Very old systems only display the options as a coded text string during power-up. The control will turn on and go through it's normal tests, and then display a text string as:

OPTN- C2D4007000

Each digit in this display references a particular option.

Turn the power Off, and back On to the control, and wait for this string to appear—then record the value in the following spaces (it may take several cycles of power Off/On to get the entire string written down correctly).

OPTN										

4.2 Option code display on newer Burny 2.5 (Series 2) systems

Controls with more recent software will have a display function called DSPY80 which tells the ON/OFF status of each option directly on the screen. Press the DSPY button and select DSPY80. When the ENTER button is pressed, the display will first show a sequence of values showing the serial number, hardware type and how much memory is used. Press the ENTER button during this sequence and the display will change to show:

OPTIONS

KERF --- ON or KERF --- OFF

Pressing enter will step down through this list and show the status of each option as ON or OFF. Record these values in the following chart for later use. Some of these options may not appear in the list since they are now considered "standard"—the chart has locations for them to make the recording process easier

4.2.1 Option ON/OFF status

OPTION NAME	ON/OFF
KERF	
SCALE	
ROTATE	
MIRROR	
PLATE ALIGN	
SERIAL COMM	
COMM ENHANCE	
CAD LINK	
PLATE MARKER	
STD. SHAPES	
TEACH	
KNIFE KERF	
CUSTOM AUX.	
LANGUAGE or individual language such as SPANISH, FRENCH, GERMAN, etc.	
FLOPPY DRIVE	
PRG. FDRT/KRF (programmable feedrate and kerf)	

5. BACKUP PART PROGRAMS

The final section of data that must be transferred from the existing Burny 2.5 to the new Burny 2.5 PLUS card are the stored part programs in the control. Part programs could have been created by either loading a Standard Shape, Template Teach, Downloading a program from the serial port or a Floppy, or creating a program using the Editor.

When the old processor card is removed from the system, these programs will be lost unless they are backed up to some external device. Some customers will already have all of their programs stored on the host computer, so there is no need to backup the data from the Burny 2.5. However, other customers will have programs created by template teach, that are only stored in the Burny 2.5's memory—these programs should be backed up if possible.

This can be done in two ways.

If the system is equipped with a serial port, and the external computing device can accept program uploads, use the STORE function in the Burny 2.5 to store to the RS-232 port and send all the internal programs up to the host computer.

If the system is equipped with an internal or external Floppy Disk drive, use the STORE function in the Burny 2.5 and store the programs to a series of floppy disks so they can be reloaded into the new card.

6. Power Off—Swap processor cards

Now that all the data from the existing Burny 2.5 processor card has either been stored to some external device, or recorded on this document on the lists provided, the old card can be removed, and the new card installed.

IMPORTANT: Remove all sources of AC power to the machine before performing any service work. The main power disconnect should be turned off and Locked in the OFF state to prevent someone from accidentally turning the power back on during the service operation.

WARNING: Proper handling procedures must be followed when installing the new MO-12438 Burny 2.5PLUS processor card. This card contains many high speed, high density electronic devices that can be damaged by STATIC ELECTRICITY caused by improper handling. Before removing the card from it's protective bag, the installing technician MUST use a grounded anti-static wrist strap connected to the machine chassis. All sources of STATIC ELECTRICITY should be removed from the area (any styrofoam, plastic packing material, bubble wrap, plastic paper sleeve protectors, etc). Once the board is removed from it's protective bag, it should be installed directly into the Burny system—do not lay it on a table or other surface that may not be grounded.

**The existing Burny 2.5 processor card should be placed back into the same protective anti-static bag after it is removed from the system. **

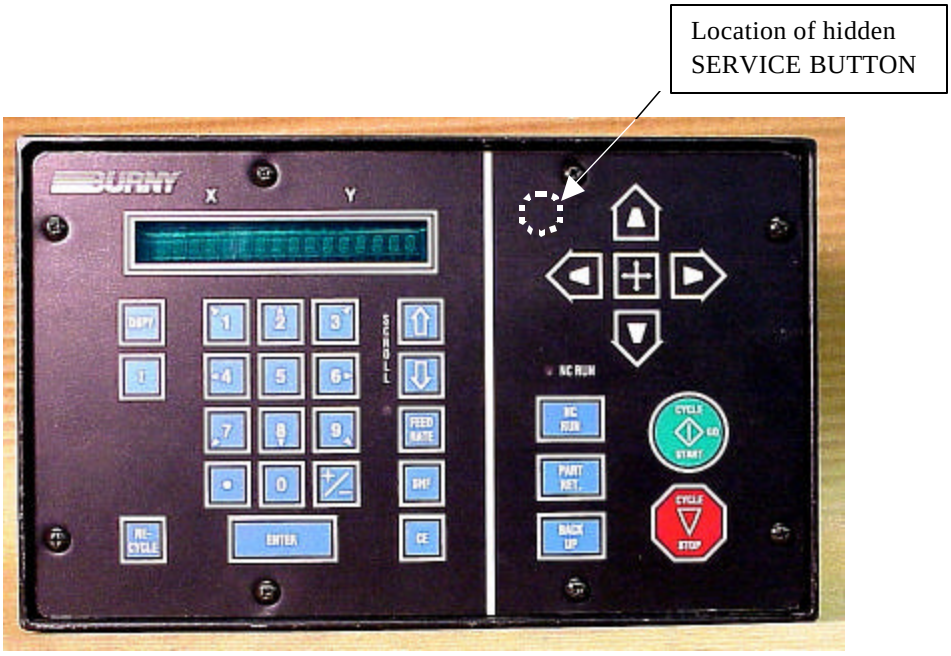


Figure 1- Typical Burny 2.5 Front Panel

Card installation:

1. Remove all sources of AC power to the machine, and lock-out the power disconnect to the machine to prevent accidental re-application of AC power during the service process.

2. Connect a grounded anti-static wrist strap to the machine frame and place it on the wrist of the installing technician.

3. Remove the screws holding the front panel of the product. For the Burny 2.5, these are the 8 screws around the keyboard panel. On the 1250 and 1400, there are 8 to 10 screws holding in the entire front hinged door. And finally, on the Burny 2.8, there are 22 screws holding the entire top cover of the cabinet—remove all but the bottom 4 screws along the lower front edge of the cabinet—just loosen the front 4 screws and lift the lid out of the slotted holes. See Figure 1.

4. Once the screws are removed, lay the front panel open so the screws holding the interface card to the processor card can be accessed.

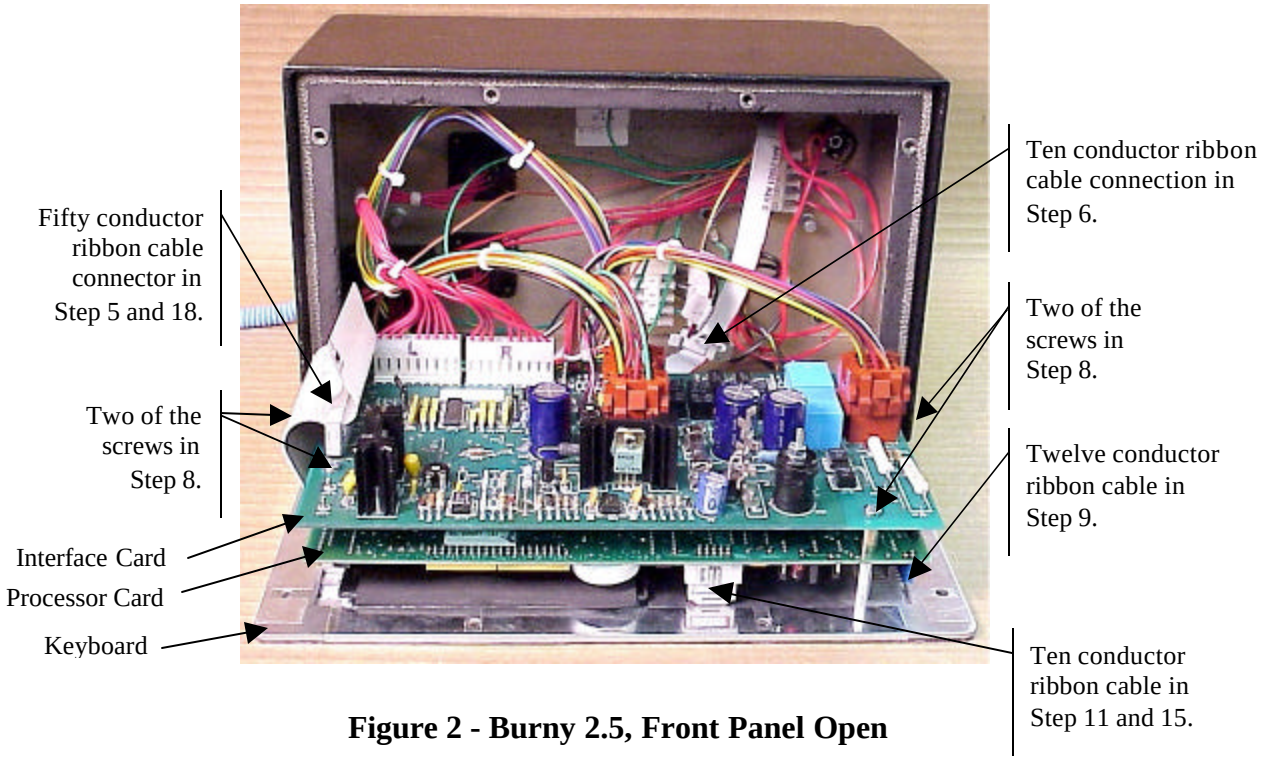


Figure 2 - Burny 2.5, Front Panel Open

5. Unplug the large 50 conductor ribbon cable that runs from the processor card to the interface card. See Figure 2.

6. Disconnect the 10 conductor ribbon cable from the processor card to the RS-232/422 modem. See Figure 2.

7. If installed, unplug the 14 conductor ribbon cable that runs from the processor card to the optional home limit switch input card used on some Burny 2.5 and 2.8 systems. See Figure 3.

8. Remove the 4 screws holding the interface card to the processor card in the system. This will make the interface and the processor card free floating so take care not to drop or stress the wires in the system during

this step. See Figure 2.

9. Lift the processor card slightly away from the keyboard panel, and unplug the 12 conductor ribbon that runs from the keyboard panel to the processor. See Figure 2.

10. Remove the old processor card from the system.

11. Remove the short 10 and/or 14 conductor ribbon cables from the old processor card—these will be re-used with the new card. See Figure 3.

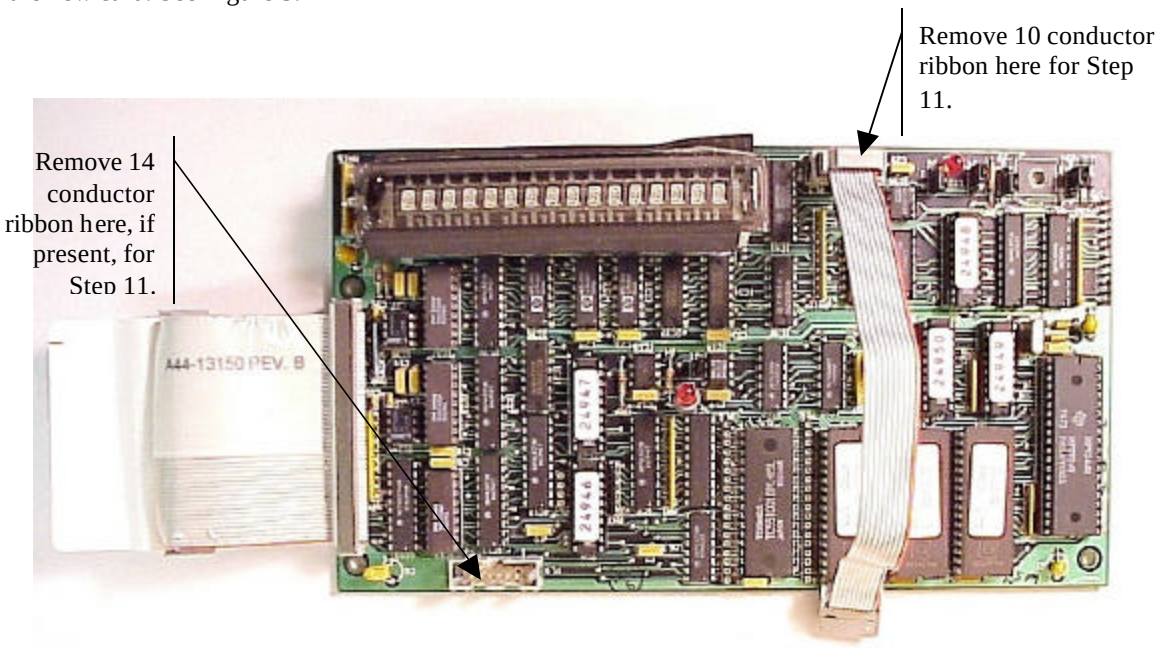


Figure 3 - Burny 2.5 Existing Processor Board

12. If a Burny 2.8 is being updated, remove the old keyboard by removing the 6 screws around the bezel on the front of the unit and discarding the old keyboard. Install the new keyboard supplied with the updated kit using the same screws and bezel as the old panel.

13. If a Burny 2.5 is being updated, discard the old keyboard. Use the new keyboard supplied with the update kit.

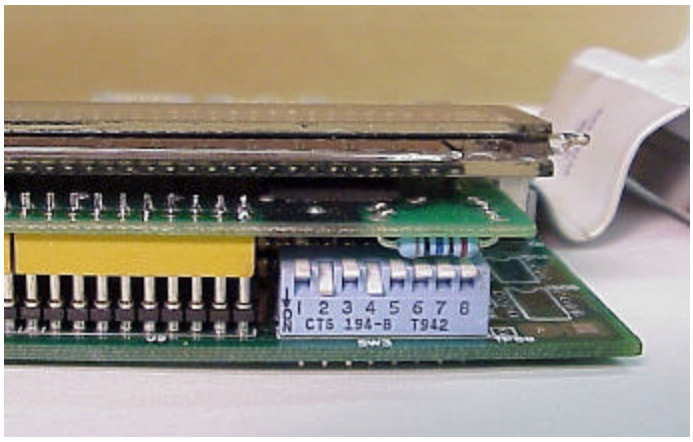


Figure 4 - DIP Switch in Step 14

14. Remove the new MO-12438 processor card from it's protective bag. See Figure 5 and 9. Set the DIP switch located on the new card under the readout as follows:

    - When using the MO-12438 card with any of the Burny 2.5 type keyboards that include the **4 DIRECTIONAL JOG ARROWS,** or with a **Burny 1250** or **Burny 1400** keyboard which also include the jog arrow buttons, the DIP switch on the MO-12438 **MUST** be set as follows:

      Position 1 -- OFF
      Position 2 -- ON
      Position 3 -- OFF
      Position 4 -- ON
      Position 5 -- OFF
      Position 6 -- OFF
      Position 7 -- OFF
      Position 8 -- OFF

      See Figure 4 -- these are the proper jumper settings when used with the new Burny 2.5 Plus front panel.

    - See APPENDIX A for details and precautions for using the MO-12438 card with older style Burny 2.5, 2.8 and private label keyboard panels.

15. Re-connect the 10 and/or 14 conductor ribbon cables to the new processor card—the connectors for these cables are located in almost the exact same location as the old card. Take care that the 10 pin cable for the serial RS-232/422 port is connected to the J4 connector on the new card. There is another 10 pin connector on the new processor card that will be used for software updates—but it will not function for the RS-232 port use. See Figure 5.

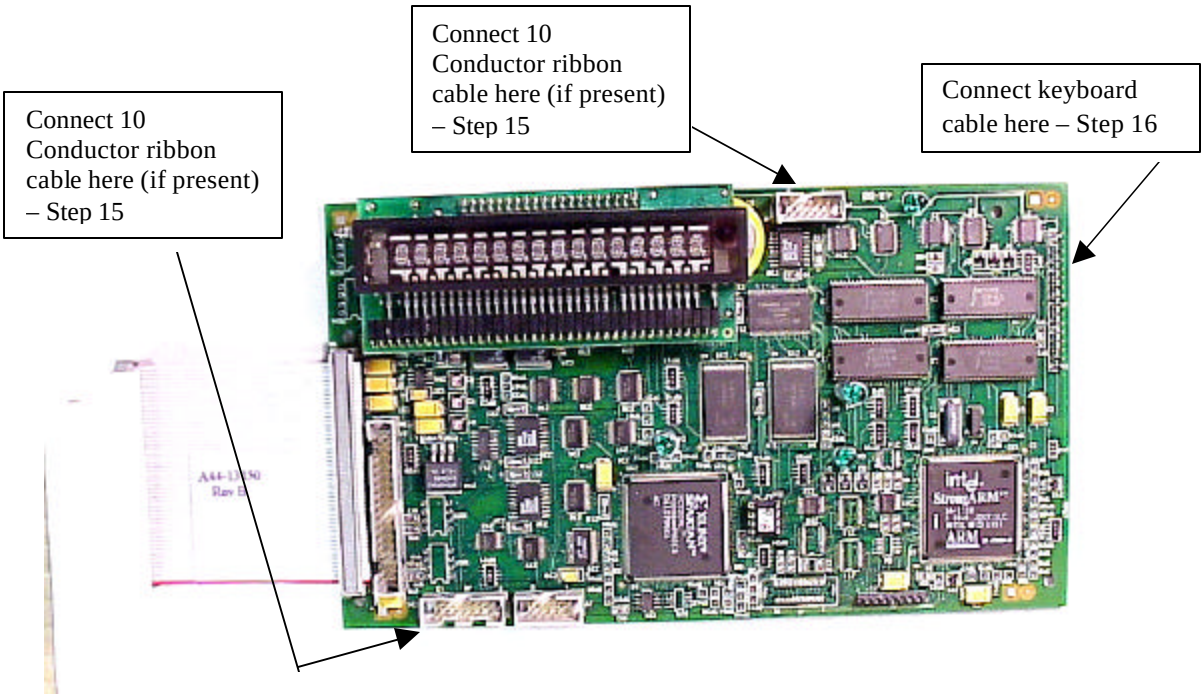


Figure 5 - Front of New Processor Board

16. Place the new MO-12438 card over the keyboard, and connect the ribbon from the keyboard to the J1 connector on the new processor card. Be sure to apply the ribbon connector starting at pin 1 of the J1 connector—the new processor card has some extra pins included in the J1 connector for future expansion—the older keyboards must be connected to the original 12 input pins. Also make sure the 10 or 14 conductor additional ribbon cables are routed under the card properly and are not pinched or interfering with the LED's or other devices.

17. Align the interface card and new processor over the keyboard standoffs, and replace the 4 screws to hold these two boards together.

18. Connect the 10, 14 and 50 conductor ribbon cables to their respective locations in the system. See Figure 2.

19. Replace the keyboard in the cabinet on 2.5 systems, close the door on the 1250/1400 or replace the 2.8's cabinet lid and replace the screws to hold in the panel or door. Make sure all screws are tight to insure a dust tight seal around the opening.

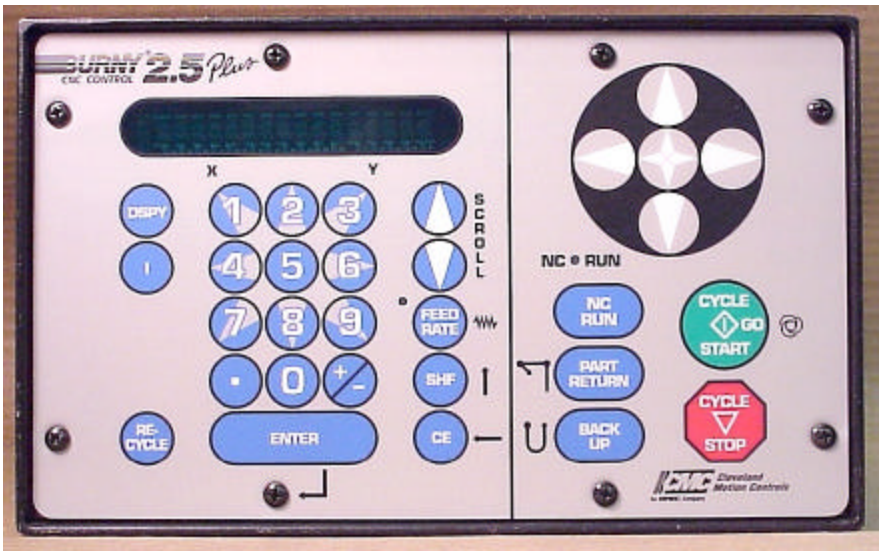


Figure 6 - Burny 2.5 *Plus* Front Panel

20. Remove the wrist strap now that the new card is installed and the cabinet is closed

21. Continue with this procedure to re-install all the data needed to make the new board function on the machine.

7. Power ON – Re-install saved data

Now that the mechanical installation of the new card is complete, the new card must be configured to run the system and act the same as the card that was removed. There will be some changes in the operation of the controls since you are updating the software to the most recent software version as a result of this card exchange. Consult the new Burny 2.5 operation manual supplied with the update kit for details on how to operate the new features.

1. Re-Apply AC power to the cutting machine and turn on the Burny system if there is a separate switch. The control should power up normally and display the familiar READY --- SELECT FUNCTION message.

2. DO NOT enable the servo drives for the system. If possible, disengage the pinion gears from the drive rack so that the machine. This is done as a precaution until it is confirmed that the parameters are working correctly in the new system.

3. Verify that the keyboard works properly. Try several operations to verify that most of the keys work correctly.

4. Press the hidden SERVICE button and select the SERV52- MEM RESET. Press ENTER and answer YES to both prompts to reset the program storage memory. After the process is done, use the DSPY80 function to display the amount of memory Used and Available. There should be almost 512K bytes available—this is the standard memory size on the MO-12438 Burny 2.5 Plus processor card.

5. Press the hidden SERVICE button and access the SERV10 parameter list. GO back to section 2.1.1 of this document and enter all the parameters in the SERV10 list. ALL PARAMETERS must be entered into the new card—do not skip any of the entries. If a value was not found in the old card, there is a suggested DEFAULT value in the table that should be entered into the new card. After the system is running, these new parameters may need to be re-adjusted to give optimal machine performance—see the new manual shipped with the update for details on the new parameter settings.

SPECIAL REQUIREMENTS FOR OLDER SYSTEMS

If the MO-12438 is being used to replace the older MO-03370, MO-4873, or MO-04875 processor cards—see APPENDIX B for information regarding the encoder scaling jumpers on these old cards, and how it affects the setup parameters

6. Refer back to Section 4 of this document where the OPTIONS from the old board were recorded. All of the features that used to be referred to as OPTIONS are now all STANDARD features in the Burny 2.5 Plus—there are no special option codes to enter. However, 2 of these old OPTION capabilities require a setting of one of the setup parameters to either ENABLE or DISABLE the feature.

COMM ENHANCE OPTION

Parameter SD51 now has a bit to control the COMM ENHANCE OPTION. This is an 8 digit parameter--for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the COMM ENHANCE option was ON with the old board, set digit D3 of the SD51 parameter to 0. (xx0xxxxx). This will cause the COMM ENHANCE to function on the new card.

- If the COMM ENHANCE option was OFF with the old board, set digit D3 of parameter SD51 to an "8" to disable the COMM ENHANCE feature on the new board— (xx8xxxxx).

KNIFE KERF OPTION

Parameter SD63 now has a bit to control the KNIFE KERF OPTION. Knife kerf is a special mode for the kerf routine that is used by the sign making industry for the special requirements of the drag knife used for cutting vinyl material, or for router cutting of plastic and aluminum for signs.

This is an 8 digit parameter-- for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the KNIFE KERF option was ON with the old board, set digit D3 of the SD63 parameter to a 1. (xx1xxxxx). This will cause the KNIFE KERF to function on the new card.

- If the KNIFE KERF option was OFF with the old board, set digit D3 of parameter SD51 to an "0" to disable the KNIFE KERF feature on the new board— (xx0xxxxx).

7. Press the hidden SERVICE button again, and access the SERV41 overlay table list. Go back to section 2.2.1 of this document and re-enter all the parameters saved from the SERV41 list in the old control.

8. Press the hidden SERVICE button again, and access the SERV42 overlay table list. Go back to section 2.3.1 of this document and re-enter all the parameters saved from the SERV42 list in the old control.

9. Press the hidden SERVICE button again, and access the SERV43 overlay table list. Go back to section 2.4.1 of this document and re-enter all the parameters saved from the SERV43 list in the old control.

10. Press the hidden SERVICE button again, and access the SERV44 overlay table list. Go back to section 2.5.1 of this document and re-enter all the parameters saved from the SERV44 list in the old control.

11. Press the hidden SERVICE button again, and access the SERV45 overlay table list. Go back to section 2.6.1 of this document and re-enter all the parameters saved from the SERV45 list in the old control.

12. Press the hidden SERVICE button and perform the SERV97 procedure to store the new parameters so they will not be lost when the power is turned off.

13. Press the hidden SERVICE button and select the SERV51-SPD CAL function—press ENTER to select the function, but DO NOT follow the prompts on the screen regarding the CYCLE START button. Instead, press the hidden SERVICE button again, and now select the SERV97 function and store the cleared speed calibration data.

14. Press the hidden SERVICE button and access the SERV78-CUSTOM AUX code conversion table. Go back to section 3.1.1 and re-enter all the data saved for the Custom AUX table from the old control. The procedure would be to press the ENTER button to get to the next AUX location, then press ENTER again to access the TVVFF entry screen. Enter the TVVFF code saved from the old control (32005) and press ENTER. You can scroll back to a previous entry to check it if desired.

15. The control should now be operational. Turn on the servo drives and test the motion of the machine. See the manual that came with this update kit for details on the new setup parameters for help in adjusting the machine's performance.

8. Appendix A – DIP Switch settings for older Burny 2.5 Front Panels

Older front panels for the Burny 2.5, as well as several of the private labeled versions did not include the 4 Directional JOG ARROWS as shown in the pictures. These panels used a sequence of pressing the II button, then used the numbered keyboard to select the jog direction.

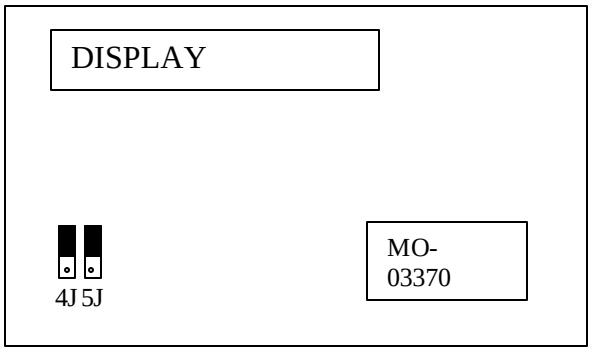
To configure the new MO-12438 board to work correctly with these older panels, the DIP switches must be set to match the configuration jumpers from the old boards.

DIP switch settings for MO-03370 processor card replacement

SW1 – ON
SW2 – OFF
SW3 – OFF
SW4 – Set to ON if Jumper 4J is set AWAY from the display.
Set to OFF if Jumper 4J is set TOWARD the display.

SW5 – Set to ON if Jumper 5J is set AWAY from the display.
Set to OFF if Jumper 5J is set TOWARD the display.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-04873 or MO-04875 processor card replacement

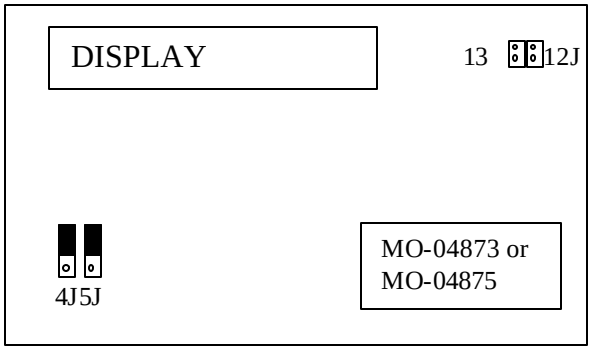
SW1 – ON
SW2 – Set to OFF if Jumper 12J is missing,
Set to ON if jumper J12 is installed

SW3 – Set to OFF if Jumper 13J is missing,
Set to ON if jumper J13 is installed

SW4 – Set to ON if Jumper 4J is set AWAY from the readout.
Set to OFF if Jumper 4J is set TOWARD the readout.

SW5 – Set to ON if Jumper 5J is set AWAY from the readout.
Set to OFF if Jumper 5J is set TOWARD the readout.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-08601 or MO-11249 processor card replacement

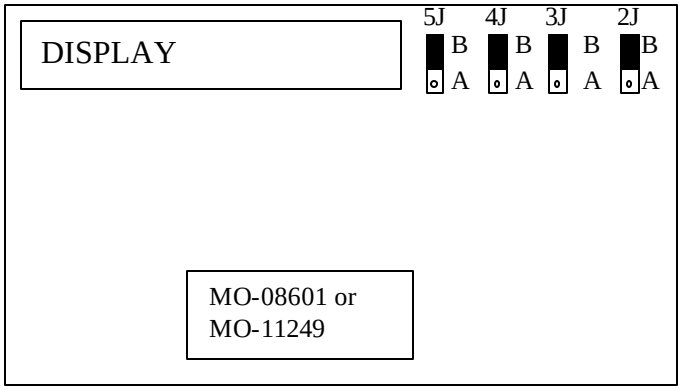
SW1 – ON
SW2– Set to OFF if Jumper J2 is set to “A”,
Set to ON if Jumper J2 is set to “B”

SW3– Set to OFF if Jumper J3 is set to “A”,
Set to ON if Jumper J3 is set to “B”

SW4– Set to OFF if Jumper J4 is set to “A”,
Set to ON if Jumper J4 is set to “B”

SW5– Set to OFF if Jumper J5 is set to “A”,
Set to ON if Jumper J5 is set to “B”

SW6, SW7, SW8 – All set to OFF



9. Appendix B – Changes to Encoder Scaling for older 2.5 updates

The older MO-03370, MO-04873 and MO-04875 processor cards included hardware jumpers J6 thru J9 on the card. These were used to tolerate faster encoder counting frequencies that could not be handled by the hardware. The newer 2.5 processor cards use faster encoder counting circuitry and eliminated these jumpers.

If one of these older boards (3370,4873,4875) are being replaced, the setting of these jumpers can affect the parameters entered into the new MO-12438 card.

If all 4 of the jumpers J6,J7,J8 and J9 are set toward the display (See Fig. 1), then the setup parameters from the old board can be directly entered into the new card.

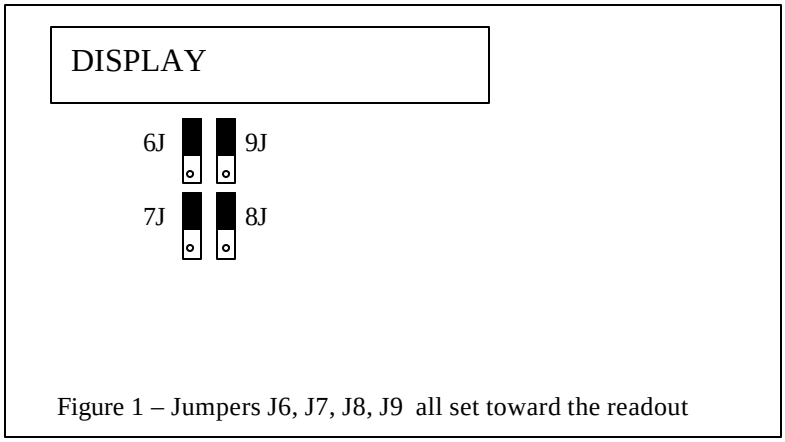


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

Some installations may be using faster encoders, particularly motor mounted encoders, and may have these jumpers set the opposite direction. If all 4 of the jumpers J6,J7, J8, J9 (Figure 2) are set away from the DISPLAY, then the value recorded for parameter SD22- ENC LINES/REV must be multiplied by 4. So for example, a system where the old card had a setting of 500 for SD22 would need to have 2000 entered into the new MO-12438 to work properly.

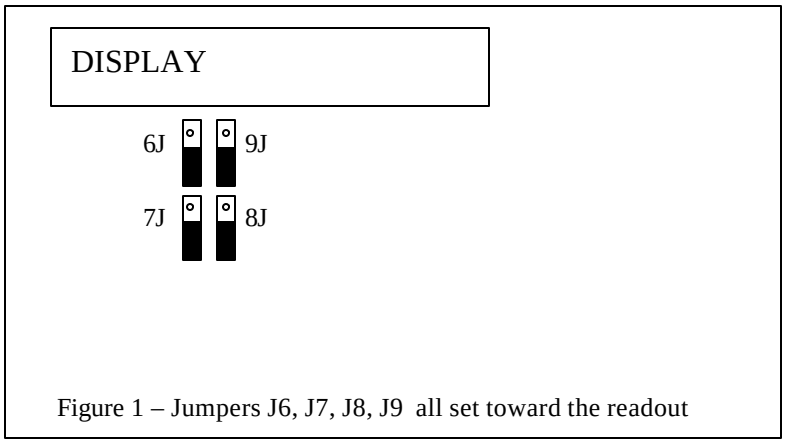


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

If the old system has jumpers J6, J7, J8, J9 set to any other random pattern, contact the factory since this will require modifying several of the system parameters. This is very uncommon.

10. Appendix C "Burny 2.5 Plus-- New features and Capabilities"

The goal of the 2.5 Plus development program was to produce a new version of the computer board in the Burny 2.5 series products that would improve the speed and system performance, without affecting the basic operation. The 2.5 Plus processor card will perform RS-232 downloads, and the Kerf calculations 80-90% faster than the older cards.

Most of the prompting, displays and operator inputs are exactly the same as the older cards—so there is little or no re-training required when the new 2.5 Plus card is substituted for an older card. However, there is the problem that the 2.5 Plus basically copies the operation of the Burny 2.5 software that was in existence at the end of 1999. If the older 2.5 card had software dating back many years (could go back as far as 1988), then there will be substantial differences in the machine's operation due to the changes and improvements that have occurred over the years of software development on the Burny 2.5 product line. This may require some additional training for the operators to become familiar with the new operation of the control, and the new capabilities available to the operator. See the new OPERATION MANUAL supplied along with this Burny 2.5 Plus product for details on all the current features of the product.

The two main areas where a difference will be noted are in the Serial I/O downloading speeds, and the Kerf processing speed.

Kerf Processing speed

The Kerf process is self contained within the Burny 2.5 Plus—there is no interaction with the outside world so the process can function at peak efficiency.

Serial I/O Downloading Speed

The Serial I/O downloading is a different matter. Since the Serial I/O communication via the RS-232/422 port connects to devices outside the Burny product, the performance of the downloading system is very dependent on the performance and setting of the external devices. For example, if the existing cutting machine had the BAUD rate set to 2400 Baud for the serial downloading speed, there will be NO increase in performance of the Serial Downloading speed with the Burny 2.5 Plus—the older card work just as well at 2400 baud as the new 2.5 Plus card. To fully take advantage of the new downloading speed capacity of the Burny 2.5 Plus card, the external system must be capable of supplying the data faster also. The following is an ESTIMATE of the speed improvement expected for various Baud rate settings of the Burny 2.5 Plus. Note that the higher baud rate settings were not even possible with the older Burny 2.5 which was normally used up to about 4800 baud.

Serial I/O Downloading Baud Rate setting	ESTIMATED speed improvement with Burny 2.5 Plus.
300 to 2400 Baud	0%-- Same speed as older card
4800 Baud	25% Less time for download
9600 Baud	60% Less time for download
19.2K Baud	80% Less time for download
28.8K Baud	80% Less time for download
38.4K Baud	75% Less time for download
57.6K to 230K Baud	60-75% Less time—note that these very high baud rates require more system overhead and are actually LESS EFFICIENT than the somewhat slower settings from 19.2K to 38.4K Baud

Serial Number and Option codes

The Burny 2.5 Plus software does not use Option codes—all possible features for the product are available as Standard capabilities with every system that ships. Similarly, there is no longer a SERIAL NUMBER imbedded into the product—the display will show " SERIAL 0" for all Burny 2.5 Plus products. The main purpose for the Serial number was to control the software lockout codes for the options—no more options means no more serial number.

The fact that all Options are now standard will cause some new menus and displays to show up on older controls where a particular option was missing before. For example, if an older Burny 2.8 did not have the STANDARD SHAPES option installed, there would not have been a menu choice for "LOAD-STANDARD SHAPE" in the select function list. When the 2.5 Plus card is installed, the operator will now see this "LOAD- STANDARD SHAPE" prompt – this should be explained to the operator ahead of time to avoid possible confusion.

The following is a list of the features that will now appear on all controls—the ones marked ** may have been missing from the older card—they are now provided as a standard capability of the new Burny 2.5 Plus software:

- RUN- PROGRAM
- LOAD- FROM STD SHAPE ** (Older card required Standard Shape option to be enabled)
- LOAD- FROM RS-232 ** (Older card required Serial I/O Option to be enabled)
- STORE- TO RS-232 ** (Older card required Serial I/O Option to be enabled)
- TEACH- PROGRAM ** (Older card required Teach Option to be enabled)
- DELETE-PROGRAM
- EDIT-PROGRAM ** (Very old cards could only access EDIT via DSPY20-)
- LOAD- FROM FLOPPY ** (Older cards required Floppy option to be enabled)
- STORE- TO FLOPPY ** (Older cards required Floppy option to be enabled)
- LOAD/RUN- RS-232 ** (Older cards required Serial I/O option to be enabled)
- LOAD/RUN-FLOPPY ** (Older cards required Floppy option to be enabled)

Some operators may complain that they have to Scroll through too many choices in this new expanded list of features to get what they want. Remember that these choices can be made with a single button push as described in the operation manual— as a reminder, the following number keys select the indicted function:

- RUN- PROGRAM -- Press the number 1 on the keypad
- LOAD- FROM STD SHAPE -- Press the number 2 on the keypad
- LOAD- FROM RS-232 -- Press the number 3 on the keypad
- STORE- TO RS-232 -- Press the number 4 on the keypad
- TEACH- PROGRAM -- Press the number 5 on the keypad
- DELETE-PROGRAM -- Press the number 6 on the keypad
- EDIT-PROGRAM -- Press the number 7 on the keypad
- LOAD- FROM FLOPPY -- Press the number +/- on the keypad
- STORE- TO FLOPPY -- Press the number . (decimal point) on the keypad
- LOAD/RUN- RS-232 -- Press the number 3, then the SHF on the keypad
- LOAD/RUN-FLOPPY -- Press the +/- key, then the SHF on the keypad

Blank

Burny 2.5 PLUS Update

Installation instructions for field upgrades using the Burny 2.5 PLUS processor card.

Also for use with MO-12685 and MO-12742 upgrade kits

ECO REVISION HISTORY

Revision	*Description*	*ECO*	*Date*
-AA	Written	---	28-July-00
-BA	Add photos, DIP Switch and parameter for old cards	CLE1716	07-Dec-00

Spec No.:	*Division:* BURNY
Author: RDM	*Rev:* **BA**
File name: AO-90177BA.doc	*Date:* **7-Dec-2000**

Cleveland Motion Controls
An IMC Company

REVISION HISTORY

Rev AA	RDM (28-July-2000) -- Written
Rev BA	JRB (7-Dec-2000) -- Added retrofit Figures and references
	RDM(7-Dec-2000) -- Add APPENDIX A,B for Dip switch settings for older front panels, and APPENDIX B for modifications needed to Encoder Scaling parameters when MO-3370 or 4873 or 4875 board was replaced.

TABLE OF CONTENTS

1. INTRODUCTION

These instructions document the steps needed to update existing Burny 2.5 controls, or any of the other Series 2 controls (1250,1400, 2.8, 2.9) with the new MO-12438 Burny 2.5 Plus processor card. The procedure assumes the installer is familiar with the Burny products and is capable of the mechanical assembly/disassembly and entry of parameters into the system.

For updates on a Burny 1250 or Burny 1400 system, the original keyboard can still be used—just the processor card is replaced as described in the following procedures.

For Burny 2.5, Burny 2.8 or Burny 2.9 systems, a special part number MO-12685 has been created to provide a new processor card with the new 2.5 Plus keyboard. This is necessary since the older Burny 2.5 keyboards do not have the proper clearance in the aluminum panel for the current readout used on the Burny 2.5 products. By ordering this MO-12685 kit, the installer is assured of having a panel that works fits the readout.

The main purpose of this particular procedure is to document all of the stored parameters, option codes, Aux code conversion tables, etc. which are configured in the existing Series 2 control BEFORE the new processor card is installed. Once the new card is operational, this stored data from the old system will be re-entered with the goal of making the new card capable of running the machine in as little time as possible.

2. PARAMETER and SYSTEM DATA RETRIEVAL

Before disassembling anything, the installer must first retrieve all the data stored in the existing Burny 2.5 system. There is no automatic way to do this with the older software, therefore the data must be manually obtained. The following pages have procedures and tables to be used to write down the parameter data, Code Conversion table data, and options enabled in the current system. Then, after the new processor card and panel are installed, these values must be manually re-entered into the new system. If this process is done correctly, and attention is paid to getting the data correct, the new system should begin operation with no further tuning required.

2.1 System Data Parameters-SERV10

With the existing system operating normally, press the hidden "SERVICE" button and access SERV10-SYS DATA. Press ENTER to display the main system parameter list. The display shows the first parameter as:

SD01-ARC ON DELAY

Press the ENTER button a second time to display the value currently set for this parameter—if the Arc On delay had been set for 3 seconds, the display would now show:

AONDLY = 3.00

Write down this 3.00 value in the following table. Press the ENTER button to access the next parameter name, and then press the ENTER button a second time to access the value—the display would have showed:

SD02-BLEEDOFF then BLEDOF= 2.00 (2 seconds used for this example)

Continue stepping through the entire list of parameters and write their values in the able provided.

IMPORTANT: Older systems may not include all the parameters shown on this list.

Older systems had less parameters than the current Burny 2.5—therefore it is important to carefully pay attention to the parameter number displayed on the screen, and match it to the table before writing the value. Any parameters that were not included in the old system will be handled during the installation portion for the new card.

2.1.1 SERV10 PARAMETERS

Parameter Number and Name	PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN	Default value to be used for older systems where a parameter was not part of the older products list.	Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system
SD01- ARC ON TIME	ARCDLY =		
SD02- BLEEDOFF	BLEDOF =		
SD03- ACCEL TIME	ACCTME =		
SD04- MAX DRV SPD	MAXSPD =		
SD06- BACKUP SPD	BCKSPD =		
SD07- CORNER SPD	CORSPD =		
SD08- MIN HLD SPD	MINHLD =		
SD09- ERR SPD MAX	ERRSPD =	20 inch/min 400 mm/min	

SD10- RUNSPD LIMIT	RUNLMT =		
SD11- TRAVERS LMT	TRVLMT =		
SD12- MIN ACCEL	MIN ACCEL =	.20 seconds	
SD14- GAIN BREAK	GAIN BREAK =	0	
SD15- ERR WRN DST	WRNDST =		
SD16- LOOP GAIN	LPGAIN =		
SD17- ARC OFF DLY	AOFDLY =	2.0 seconds	
SD18- SLWDWN DIST	SLWDST =		
SD19- DISABL DIST	DISABL =	.25 inches 6.3 mm	
SD20- X ENC DIST	XENSCL =		
SD21- Y ENC DIST	YENSCL =		
SD22- ENC LIN/REV	ENC LINES =		
SD23- X ENC DIR	X ENC DIR -		
SD24- Y ENC DIR	Y ENC DIR -		
SD25- X DRV DIR	X DRV DIR -		
SD26- Y DRV DIR	Y DRV DIR -		
SD27- PLATE SIDE	PLATE ON -		
SD28- HEIGHT RLY	CONTACT -		
SD29- SLWDWN RAD	SLWRAD =		
SD30- MIN RAD SPD	MRADSP =	30 inches/min 150 mm/min	
SD31- PLASMA TB1	PLASMA TB1 =	NO	
SD32- MIN SLW ANG	MINSLW =	10	
SD33- MAX SLW ANG	MAXSLW =	22	
SD40- X MARK OFF	XOFST1 =		
SD41- Y MARK OFF	YOFST1 =		
SD42- MARKER SPD	MRKSPD =		
SD43- MARK DELAY	MRKDLY =		
SD45- DEFLT DWELL	DFDWEL =		
SD46- MIN OFF DWL	MINOFF =		
SD47- XOFST2	XOFST2 =		

SD48- YOFST2	YOFST2=		
SD49- START DELAY	STRDLY =	1.5 seconds	
SD50- SERIAL DEFN	SERIAL DEFN =		
SD5- PRGM FORMAT	PGMFMT =		
SD52- SPECIAL EOP	EOP 1 =		
SD53- FILE EXTEN	FEXTEN =	434E4300	
SD60- OPER SYS	OPER SYS =		
SD61- SYS CONFG 1	SYSCFG1 =		
SD62- SYS CONFG 2	SYSCFG2 =		
SD63- SYS CONFG 3	SYSCFG3 =	0	
SD65- OVERLAY CFG	OVERLAY CFG =	0	
SD68- SPEED RANGE	SPEED RANGE =	4	
SD69- LA NGUAGE	LANGUAGE =	0	
SD70- KNF ROT DIA	KNFDIA =		
SD71- KNF B.P. ANG	KNF B.P. ANG =		
SD74- T2XHOM	T2XHOM =		
SD75-T2YHOM	T2YHOM =		
SD76- T3XHOM	T3XHOM =		
SD77- T3YHOM	T3YHOM =		
SD78- T4XHOM	T4XHOM =		
SD79- T4YHOM	T4YHOM =		
SD80- XOFST1	XOFST1 =		
SD81- XOFST1	YOFST1 =		
SD82- XOFST2	XOFST2 =		
SD83- XOFST2	YOFST2 =		
SD84- XOFST3	XOFST3 =		
SD85- XOFST3	YOFST3 =		
SD86- XOFST4	XOFST4 =		
SD87- XOFST4	YOFST4 =		
SD88- XOFST5	XOFST5 =		

SD89- XOFST5	YOFST5 =		
SD90- XOFST6	XOFST6 =		
SD91- XOFST6	YOFST6 =		
SD92- XOFST7	XOFST7 =		
SD93- XOFST7	YOFST7 =		
SD94- XOFST8	XOFST8 =		
SD95- XOFST8	YOFST8 =		
SD96- XHOMSW	XHOMSW =		
SD97- XHOMSW	YHOMSW =		
SDA0- XBKLSH	XBKLSH =	0	
SDA1- YBKLSH	YBKLSH =	0	
SDA2- LSH RATE	LSH RATE =		
SDD0- SYNC W-AXIS	SYNC ENABLE =	NO	
SDD1- W GAIN	W GAIN =		
SDD2- SKEW LIMT	SKWLMT =		
SDD3- W MAX SPD	WMXSPD =		
SDD4- W ENC DIR	W ENCODER =		
SDD5- W DRV DIR	W DRIVE =		
SDD6- WBKLSH	WBKLSH =		
SDD7 – W OFFSET	WOFSET =		

2.2 System Overlay Table #1 Parameters - SERV41

Burny 2.5 systems built after 1983 had the 5 sets of additional setup parameters which could be selected by programming codes within a part program to "overlay" the standard SERV10 parameter list. Access this list of values by pressing the hidden "SERVICE" button and access SERV41-TB 1 DATA. Press ENTER to display the overlay table #1 list. Note this list is much shorter than the SERV10 list. Again, carefully step down through the list and write the values in the following list:

2.2.1 SERV41 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
1-03- ACCEL TIME	ACCTME =		
1-07- CORNER SPD	CORSPD =		
1-10- RUNSPD LIMIT	RUNLMT =		
1-12- MIN ACCEL	MIN ACCEL =		
1-14- GAIN BREAK	GAIN BREAK =		
1-16- LOOP GAIN	LPGAIN =		
1-18- SLWDWN DIST	SLWDST =		
1-19- DISABL DIST	DISABL =		
1-29- SLWDWN RAD	SLWRAD =		
1-30- MIN RAD SPD	MRADSP =		
1-32- MIN SLW ANG	MINSLW =		
1-33- MAX SLW ANG	MAXSLW =		
1-45- DEFLT DWELL	DFDWEL =		
1-46- MIN OFF DWL	MINOFF =		
1-49- START DELAY	STRDLY =		

2.3 System Overlay Table #2 Parameters - SERV42

Continue with this process to access the data in Overlay Table #2 by pressing the hidden "SERVICE" button and access SERV42-TB 2 DATA. Press ENTER to display the overlay table #2 list.

2.3.1 SERV42 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
2-03- ACCEL TIME	ACCTME =		
2-07- CORNER SPD	CORSPD =		
2-10- RUNSPD LIMIT	RUNLMT =		
2-12- MIN ACCEL	MIN ACCEL =		
2-14- GAIN BREAK	GAIN BREAK =		
2-16- LOOP GAIN	LPGAIN =		
2-18- SLWDWN DIST	SLWDST =		
2-19- DISABL DIST	DISABL =		
2-29- SLWDWN RAD	SLWRAD =		
2-30- MIN RAD SPD	MRADSP =		
2-32- MIN SLW ANG	MINSLW =		
2-33- MAX SLW ANG	MAXSLW =		
2-45- DEFLT DWELL	DFDWEL =		
2-46- MIN OFF DWL	MINOFF =		
2-49- START DELAY	STRDLY =		

2.4 System Overlay Table #3 Parameters - SERV43

Continue with this process to access the data in Overlay Table #3 by pressing the hidden "SERVICE" button and access SERV43-TB 3 DATA. Press ENTER to display the overlay table #3 list.

2.4.1 SERV43 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
3-03- ACCEL TIME	ACCTME =		
3-07- CORNER SPD	CORSPD =		
3-10- RUNSPD LIMIT	RUNLMT =		
3-12- MIN ACCEL	MIN ACCEL =		
3-14- GAIN BREAK	GAIN BREAK =		
3-16- LOOP GAIN	LPGAIN =		
3-18- SLWDWN DIST	SLWDST =		
3-19- DISABL DIST	DISABL =		
3-29- SLWDWN RAD	SLWRAD =		
3-30- MIN RAD SPD	MRADSP =		
3-32- MIN SLW ANG	MINSLW =		
3-33- MAX SLW ANG	MAXSLW =		
3-45- DEFLT DWELL	DFDWEL =		
3-46- MIN OFF DWL	MINOFF =		
3-49- START DELAY	STRDLY =		

2.5 System Overlay Table #4 Parameters - SERV44

Continue with this process to access the data in Overlay Table #4 by pressing the hidden "SERVICE" button and access SERV44-TB 4 DATA. Press ENTER to display the overlay table #4 list.

2.5.1 SERV44 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
4-03- ACCEL TIME	ACCTME =		
4-07- CORNER SPD	CORSPD =		
4-10- RUNSPD LIMIT	RUNLMT =		
4-12- MIN ACCEL	MIN ACCEL =		
4-14- GAIN BREAK	GAIN BREAK =		
4-16- LOOP GAIN	LPGAIN =		
4-18- SLWDWN DIST	SLWDST =		
4-19- DISABL DIST	DISABL =		
4-29- SLWDWN RAD	SLWRAD =		
4-30- MIN RAD SPD	MRADSP =		
4-32- MIN SLW ANG	MINSLW =		
4-33- MAX SLW ANG	MAXSLW =		
4-45- DEFLT DWELL	DFDWEL =		
4-46- MIN OFF DWL	MINOFF =		
4-49- START DELAY	STRDLY =		

2.6 System Overlay Table #5 Parameters - SERV45

Continue with this process to access the data in Overlay Table #5 by pressing the hidden "SERVICE" button and access SERV45-TB 5 DATA. Press ENTER to display the overlay table #5 list.

2.6.1 SERV54 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
5-03- ACCEL TIME	ACCTME =		
5-07- CORNER SPD	CORSPD =		
5-10- RUNSPD LIMIT	RUNLMT =		
5-12- MIN ACCEL	MIN ACCEL =		
5-14- GAIN BREAK	GAIN BREAK =		
5-16- LOOP GAIN	LPGAIN =		
5-18- SLWDWN DIST	SLWDST =		
5-19- DISABL DIST	DISABL =		
5-29- SLWDWN RAD	SLWRAD =		
5-30- MIN RAD SPD	MRADSP =		
5-32- MIN SLW ANG	MINSLW =		
5-33- MAX SLW ANG	MAXSLW =		
5-45- DEFLT DWELL	DFDWEL =		
5-46- MIN OFF DWL	MINOFF =		
5-49- START DELAY	STRDLY =		

3. Retrieving Custom Aux Table Data – SERV78

The Burny 2.5 has the ability to convert the M and G or ESSI auxiliary functions in a part program into the functional codes needed by the Burny to cut the part. The data for making this conversion is contained in a list accessed by pressing the hidden "SERVICE" button, and then selecting the SERV78-CUSTOM AUX utility. Press ENTER to access the first entry in the list. There are 2 display formats used with this list—when the table is first accessed, the display will be in the "Table position" mode which shows which of the 50 possible entries is being displayed, and the current setting for that table location:

AUX01-M20-CUTOFF

This indicates that the first table location "AUX01" contains the data to convert an M20 code from a word address program into an internal Cut Off function—turn the oxygen or plasma off at the end of a cut.

Pressing ENTER at this point changes the display to show the TVVFF code for the AUX01 entry—the display will appear as:

32005-M20-CUTOFF

The 32005 is the TVVFF code:

T -- a single digit that defines the type of code begin converted (1-ESSI, 2-G code, 3-M code)

VV – a 2 or 3 digit value (up to 127) that defines the numeric value for the code (20 in this example)

FF – a 2 digit code defining the internal function assigned to the code (see Burny 2.5 manual for the list)

It is NOT necessary to understand what all these codes do to install the Burny 2.5 Plus processor card--- the important thing is to get them written down in the following chart so they can be re-entered in the new control.

The procedure would be to step through the list for each of the AUX entries and write down the data displayed for the block and the TVVFF displays.

While this list contains a maximum of 50 entries, the number of AUX table entries is usually much less. The end of the list is indicated by a display of a location being AVAILABLE. This means that no data has been entered for this table entry—the Burny will not search the table past this AVAILABLE location therefore any data following the first AVAILABLE location is not needed—it would not affect the controls operation in any way.

Begin stepping through the list and write down the data in the following chart:

3.1.1 AUX CODE TABLE DATA

Table location display: Example: AUX01 – M20 – CUT OFF	TVVFF display Example:32005 – M20 – CUT OFF
AUX01 -- --	-- --
AUX02 -- --	-- --
AUX03 -- --	-- --

AUX04	--	--	--	--
AUX05	--	--	--	--
AUX06	--	--	--	--
AUX07	--	--	--	--
AUX08	--	--	--	--
AUX09	--	--	--	--
AUX10	--	--	--	--
AUX11	--	--	--	--
AUX12	--	--	--	--
AUX13	--	--	--	--
AUX14	--	--	--	--
AUX15	--	--	--	--
AUX16	--	--	--	--
AUX17	--	--	--	--
AUX18	--	--		
AUX19	--	--		
AUX20	--	--		
AUX21	--	--		
AUX22	--	--		
AUX23	--	--		
AUX24	--	--		
AUX25	--	--		
AUX26	--	--		
AUX27	--	--		
AUX28	--	--		
AUX29	--	--		
AUX30	--	--		
AUX31	--	--		
AUX32	--	--	--	--
AUX33	--	--	--	--
AUX34	--	--	--	--
AUX35	--	--	--	--
AUX36	--	--	--	--

AUX37	--	--	--	--	
AUX38	--	--			
AUX39	--	--			
AUX40	--	--			
AUX41	--	--			
AUX42	--	--			
AUX43	--	--			
AUX44	--	--			
AUX45	--	--			
AUX46	--	--			
AUX47	--	--			
AUX48	--	--			
AUX49	--	--			
AUX50	--	--			

4. OPTION CODES

All of the Burny 2.5 and related Series 2 controls have various software options that are enabled by special "Lockout" codes based on the serial number of the control. While the new Burny 2.5 Plus card has all "options" now loaded as standard features, the Option Settings for the old board must be documented to determine some of the parameter settings on the new board.

There are two ways that this is done, depending on the age of the software in the existing control.

4.1 Option code display on very old systems.

Very old systems only display the options as a coded text string during power-up. The control will turn on and go through it's normal tests, and then display a text string as:

OPTN- C2D4007000

Each digit in this display references a particular option.

Turn the power Off, and back On to the control, and wait for this string to appear—then record the value in the following spaces (it may take several cycles of power Off/On to get the entire string written down correctly).

OPTN										

4.2 Option code display on newer Burny 2.5 (Series 2) systems

Controls with more recent software will have a display function called DSPY80 which tells the ON/OFF status of each option directly on the screen. Press the DSPY button and select DSPY80. When the ENTER button is pressed, the display will first show a sequence of values showing the serial number, hardware type and how much memory is used. Press the ENTER button during this sequence and the display will change to show:

OPTIONS

KERF --- ON or KERF --- OFF

Pressing enter will step down through this list and show the status of each option as ON or OFF. Record these values in the following chart for later use. Some of these options may not appear in the list since they are now considered "standard"—the chart has locations for them to make the recording process easier

4.2.1 Option ON/OFF status

OPTION NAME	ON/OFF
KERF	
SCALE	
ROTATE	
MIRROR	
PLATE ALIGN	
SERIAL COMM	
COMM ENHANCE	
CAD LINK	
PLATE MARKER	
STD. SHAPES	
TEACH	
KNIFE KERF	
CUSTOM AUX.	
LANGUAGE or individual language such as SPANISH, FRENCH, GERMAN, etc.	
FLOPPY DRIVE	
PRG. FDRT/KRF (programmable feedrate and kerf)	

5. BACKUP PART PROGRAMS

The final section of data that must be transferred from the existing Burny 2.5 to the new Burny 2.5 PLUS card are the stored part programs in the control. Part programs could have been created by either loading a Standard Shape, Template Teach, Downloading a program from the serial port or a Floppy, or creating a program using the Editor.

When the old processor card is removed from the system, these programs will be lost unless they are backed up to some external device. Some customers will already have all of their programs stored on the host computer, so there is no need to backup the data from the Burny 2.5. However, other customers will have programs created by template teach, that are only stored in the Burny 2.5's memory—these programs should be backed up if possible.

This can be done in two ways.

If the system is equipped with a serial port, and the external computing device can accept program uploads, use the STORE function in the Burny 2.5 to store to the RS-232 port and send all the internal programs up to the host computer.

If the system is equipped with an internal or external Floppy Disk drive, use the STORE function in the Burny 2.5 and store the programs to a series of floppy disks so they can be reloaded into the new card.

6. Power Off—Swap processor cards

Now that all the data from the existing Burny 2.5 processor card has either been stored to some external device, or recorded on this document on the lists provided, the old card can be removed, and the new card installed.

IMPORTANT: Remove all sources of AC power to the machine before performing any service work. The main power disconnect should be turned off and Locked in the OFF state to prevent someone from accidentally turning the power back on during the service operation.

WARNING: Proper handling procedures must be followed when installing the new MO-12438 Burny 2.5PLUS processor card. This card contains many high speed, high density electronic devices that can be damaged by STATIC ELECTRICITY caused by improper handling. Before removing the card from it's protective bag, the installing technician MUST use a grounded anti-static wrist strap connected to the machine chassis. All sources of STATIC ELECTRICITY should be removed from the area (any styrofoam, plastic packing material, bubble wrap, plastic paper sleeve protectors, etc). Once the board is removed from it's protective bag, it should be installed directly into the Burny system—do not lay it on a table or other surface that may not be grounded.

**The existing Burny 2.5 processor card should be placed back into the same protective anti-static bag after it is removed from the system. **

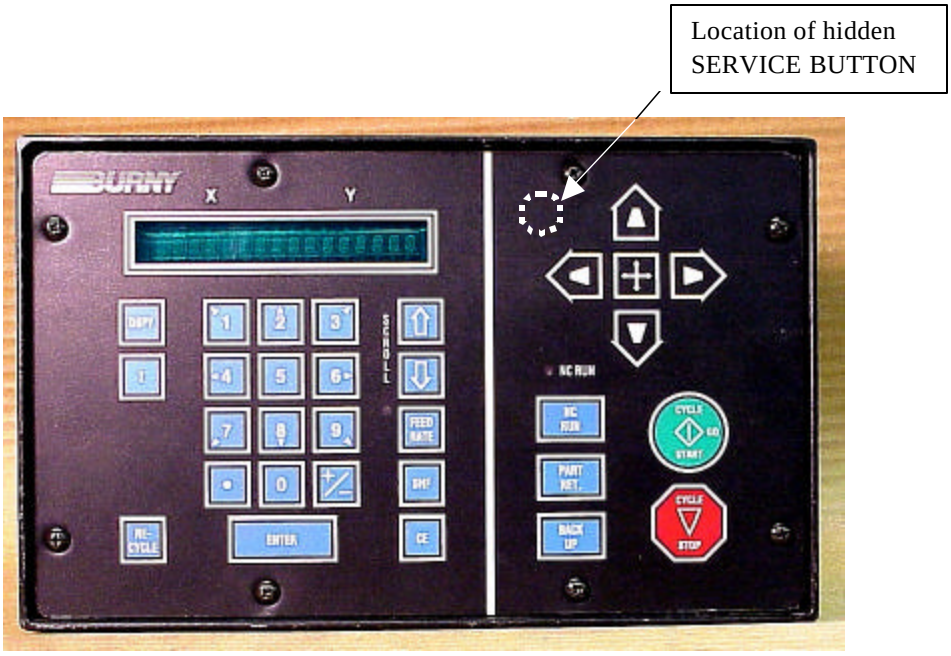


Figure 1- Typical Burny 2.5 Front Panel

Card installation:

1. Remove all sources of AC power to the machine, and lock-out the power disconnect to the machine to prevent accidental re-application of AC power during the service process.

2. Connect a grounded anti-static wrist strap to the machine frame and place it on the wrist of the installing technician.

3. Remove the screws holding the front panel of the product. For the Burny 2.5, these are the 8 screws around the keyboard panel. On the 1250 and 1400, there are 8 to 10 screws holding in the entire front hinged door. And finally, on the Burny 2.8, there are 22 screws holding the entire top cover of the cabinet—remove all but the bottom 4 screws along the lower front edge of the cabinet—just loosen the front 4 screws and lift the lid out of the slotted holes. See Figure 1.

4. Once the screws are removed, lay the front panel open so the screws holding the interface card to the processor card can be accessed.

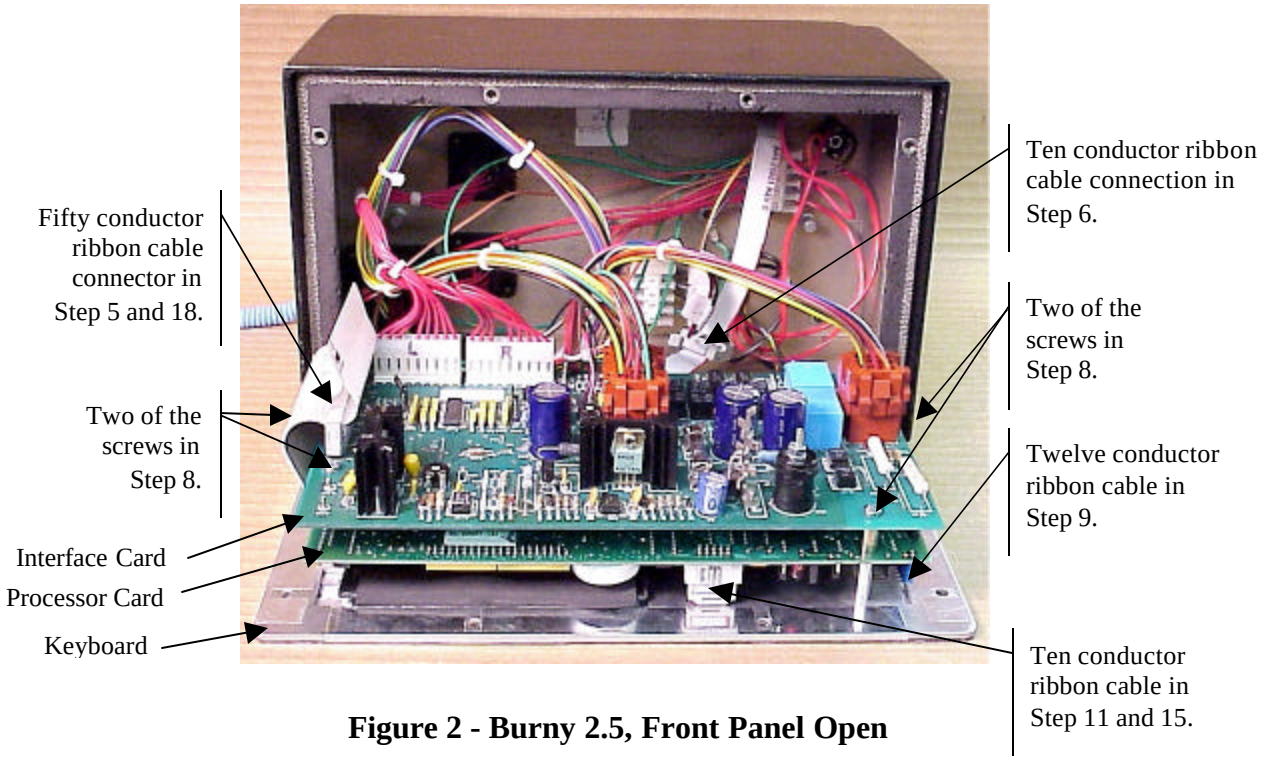


Figure 2 - Burny 2.5, Front Panel Open

5. Unplug the large 50 conductor ribbon cable that runs from the processor card to the interface card. See Figure 2.

6. Disconnect the 10 conductor ribbon cable from the processor card to the RS-232/422 modem. See Figure 2.

7. If installed, unplug the 14 conductor ribbon cable that runs from the processor card to the optional home limit switch input card used on some Burny 2.5 and 2.8 systems. See Figure 3.

8. Remove the 4 screws holding the interface card to the processor card in the system. This will make the interface and the processor card free floating so take care not to drop or stress the wires in the system during

this step. See Figure 2.

9. Lift the processor card slightly away from the keyboard panel, and unplug the 12 conductor ribbon that runs from the keyboard panel to the processor. See Figure 2.

10. Remove the old processor card from the system.

11. Remove the short 10 and/or 14 conductor ribbon cables from the old processor card—these will be re-used with the new card. See Figure 3.

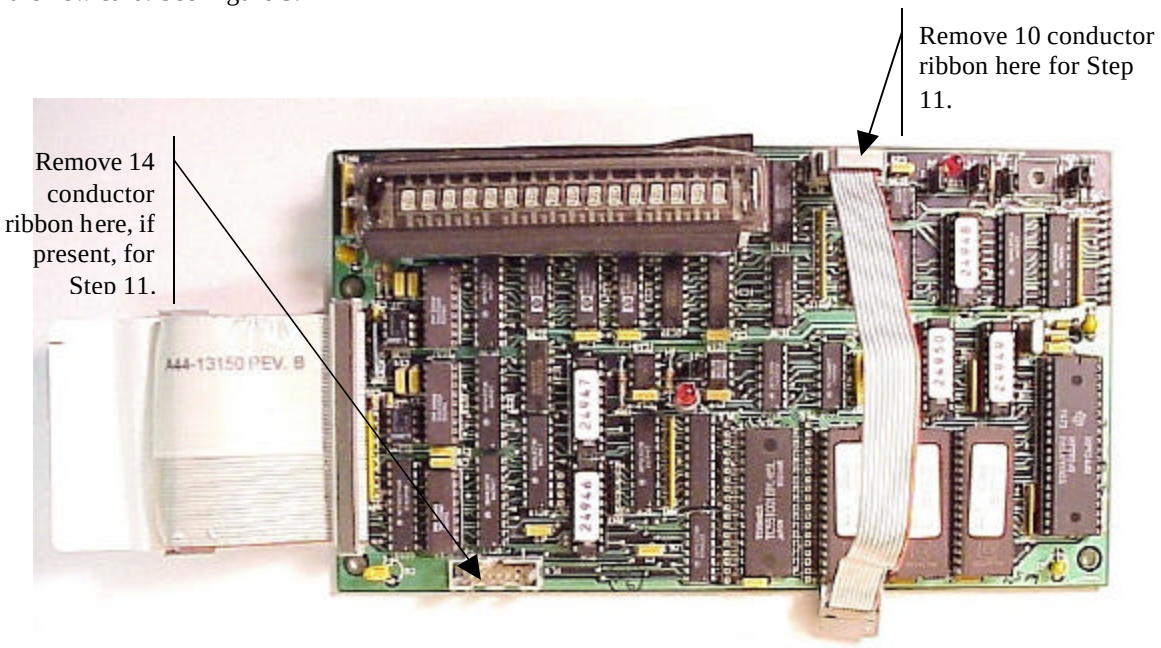


Figure 3 - Burny 2.5 Existing Processor Board

12. If a Burny 2.8 is being updated, remove the old keyboard by removing the 6 screws around the bezel on the front of the unit and discarding the old keyboard. Install the new keyboard supplied with the updated kit using the same screws and bezel as the old panel.

13. If a Burny 2.5 is being updated, discard the old keyboard. Use the new keyboard supplied with the update kit.

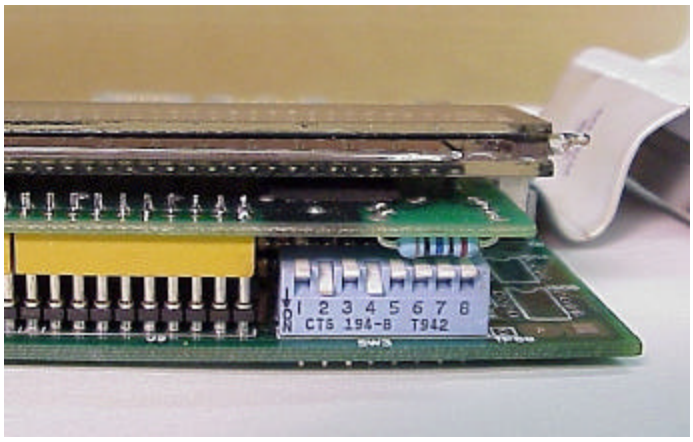


Figure 4 - DIP Switch in Step 14

14. Remove the new MO-12438 processor card from it's protective bag. See Figure 5 and 9. Set the DIP switch located on the new card under the readout as follows:

    - When using the MO-12438 card with any of the Burny 2.5 type keyboards that include the **4 DIRECTIONAL JOG ARROWS,** or with a **Burny 1250** or **Burny 1400** keyboard which also include the jog arrow buttons, the DIP switch on the MO-12438 **MUST** be set as follows:

      Position 1 -- OFF
      Position 2 -- ON
      Position 3 -- OFF
      Position 4 -- ON
      Position 5 -- OFF
      Position 6 -- OFF
      Position 7 -- OFF
      Position 8 -- OFF

      See Figure 4 -- these are the proper jumper settings when used with the new Burny 2.5 Plus front panel.

    - See APPENDIX A for details and precautions for using the MO-12438 card with older style Burny 2.5, 2.8 and private label keyboard panels.

15. Re-connect the 10 and/or 14 conductor ribbon cables to the new processor card—the connectors for these cables are located in almost the exact same location as the old card. Take care that the 10 pin cable for the serial RS-232/422 port is connected to the J4 connector on the new card. There is another 10 pin connector on the new processor card that will be used for software updates—but it will not function for the RS-232 port use. See Figure 5.

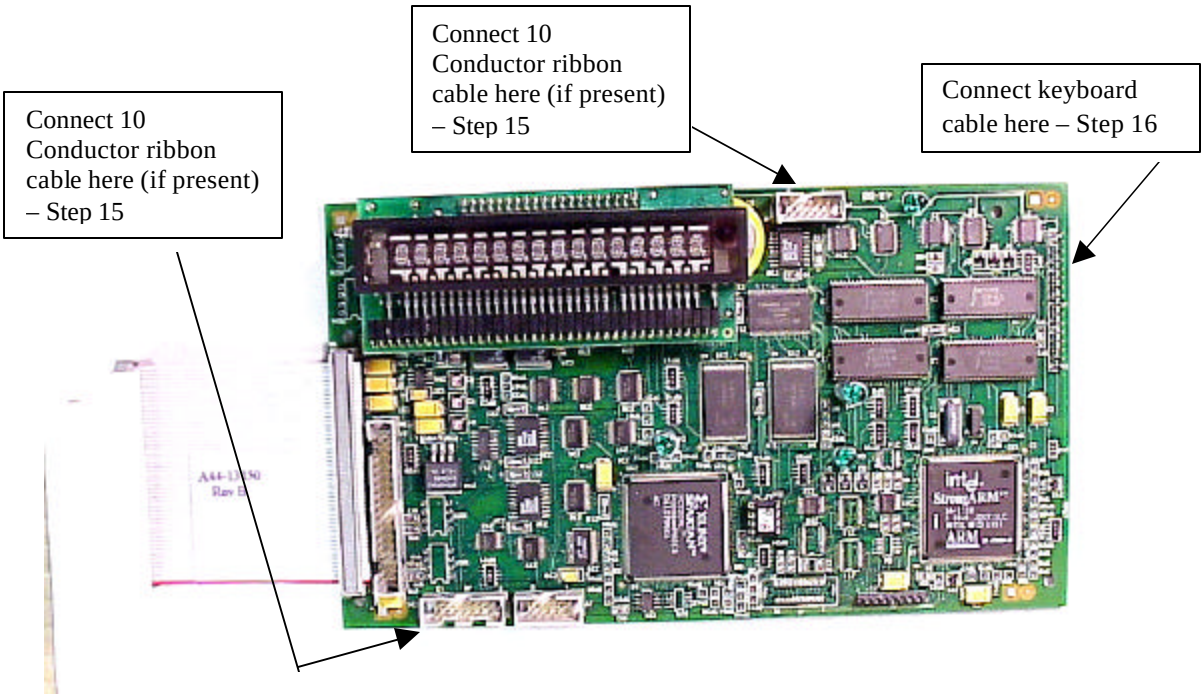


Figure 5 - Front of New Processor Board

16. Place the new MO-12438 card over the keyboard, and connect the ribbon from the keyboard to the J1 connector on the new processor card. Be sure to apply the ribbon connector starting at pin 1 of the J1 connector—the new processor card has some extra pins included in the J1 connector for future expansion—the older keyboards must be connected to the original 12 input pins. Also make sure the 10 or 14 conductor additional ribbon cables are routed under the card properly and are not pinched or interfering with the LED's or other devices.

17. Align the interface card and new processor over the keyboard standoffs, and replace the 4 screws to hold these two boards together.

18. Connect the 10, 14 and 50 conductor ribbon cables to their respective locations in the system. See Figure 2.

19. Replace the keyboard in the cabinet on 2.5 systems, close the door on the 1250/1400 or replace the 2.8's cabinet lid and replace the screws to hold in the panel or door. Make sure all screws are tight to insure a dust tight seal around the opening.

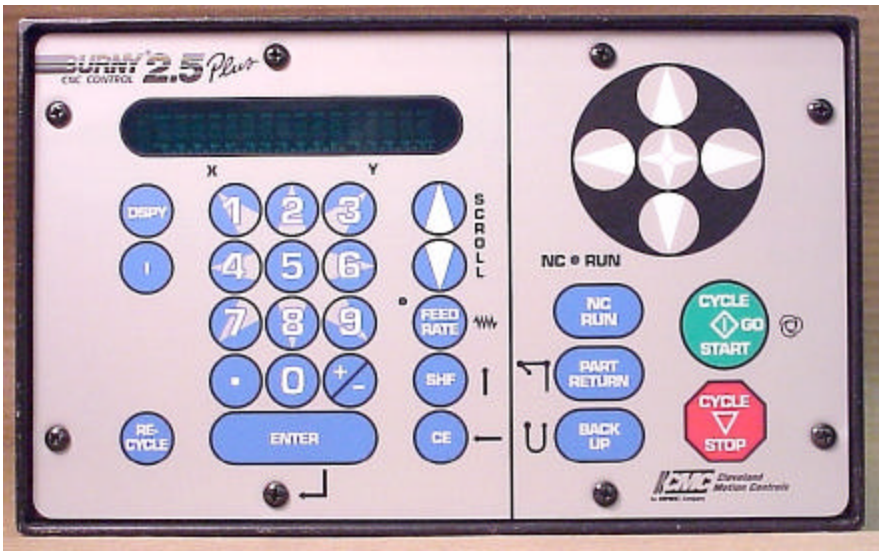


Figure 6 - Burny 2.5 *Plus* Front Panel

20. Remove the wrist strap now that the new card is installed and the cabinet is closed

21. Continue with this procedure to re-install all the data needed to make the new board function on the machine.

7. Power ON – Re-install saved data

Now that the mechanical installation of the new card is complete, the new card must be configured to run the system and act the same as the card that was removed. There will be some changes in the operation of the controls since you are updating the software to the most recent software version as a result of this card exchange. Consult the new Burny 2.5 operation manual supplied with the update kit for details on how to operate the new features.

1. Re-Apply AC power to the cutting machine and turn on the Burny system if there is a separate switch. The control should power up normally and display the familiar READY --- SELECT FUNCTION message.

2. DO NOT enable the servo drives for the system. If possible, disengage the pinion gears from the drive rack so that the machine. This is done as a precaution until it is confirmed that the parameters are working correctly in the new system.

3. Verify that the keyboard works properly. Try several operations to verify that most of the keys work correctly.

4. Press the hidden SERVICE button and select the SERV52- MEM RESET. Press ENTER and answer YES to both prompts to reset the program storage memory. After the process is done, use the DSPY80 function to display the amount of memory Used and Available. There should be almost 512K bytes available—this is the standard memory size on the MO-12438 Burny 2.5 Plus processor card.

5. Press the hidden SERVICE button and access the SERV10 parameter list. GO back to section 2.1.1 of this document and enter all the parameters in the SERV10 list. ALL PARAMETERS must be entered into the new card—do not skip any of the entries. If a value was not found in the old card, there is a suggested DEFAULT value in the table that should be entered into the new card. After the system is running, these new parameters may need to be re-adjusted to give optimal machine performance—see the new manual shipped with the update for details on the new parameter settings.

SPECIAL REQUIREMENTS FOR OLDER SYSTEMS

If the MO-12438 is being used to replace the older MO-03370, MO-4873, or MO-04875 processor cards—see APPENDIX B for information regarding the encoder scaling jumpers on these old cards, and how it affects the setup parameters

6. Refer back to Section 4 of this document where the OPTIONS from the old board were recorded. All of the features that used to be referred to as OPTIONS are now all STANDARD features in the Burny 2.5 Plus—there are no special option codes to enter. However, 2 of these old OPTION capabilities require a setting of one of the setup parameters to either ENABLE or DISABLE the feature.

COMM ENHANCE OPTION

Parameter SD51 now has a bit to control the COMM ENHANCE OPTION. This is an 8 digit parameter--for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the COMM ENHANCE option was ON with the old board, set digit D3 of the SD51 parameter to 0. (xx0xxxxx). This will cause the COMM ENHANCE to function on the new card.

- If the COMM ENHANCE option was OFF with the old board, set digit D3 of parameter SD51 to an "8" to disable the COMM ENHANCE feature on the new board— (xx8xxxxx).

KNIFE KERF OPTION

Parameter SD63 now has a bit to control the KNIFE KERF OPTION. Knife kerf is a special mode for the kerf routine that is used by the sign making industry for the special requirements of the drag knife used for cutting vinyl material, or for router cutting of plastic and aluminum for signs.

This is an 8 digit parameter-- for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the KNIFE KERF option was ON with the old board, set digit D3 of the SD63 parameter to a 1. (xx1xxxxx). This will cause the KNIFE KERF to function on the new card.

- If the KNIFE KERF option was OFF with the old board, set digit D3 of parameter SD51 to an "0" to disable the KNIFE KERF feature on the new board— (xx0xxxxx).

7. Press the hidden SERVICE button again, and access the SERV41 overlay table list. Go back to section 2.2.1 of this document and re-enter all the parameters saved from the SERV41 list in the old control.

8. Press the hidden SERVICE button again, and access the SERV42 overlay table list. Go back to section 2.3.1 of this document and re-enter all the parameters saved from the SERV42 list in the old control.

9. Press the hidden SERVICE button again, and access the SERV43 overlay table list. Go back to section 2.4.1 of this document and re-enter all the parameters saved from the SERV43 list in the old control.

10. Press the hidden SERVICE button again, and access the SERV44 overlay table list. Go back to section 2.5.1 of this document and re-enter all the parameters saved from the SERV44 list in the old control.

11. Press the hidden SERVICE button again, and access the SERV45 overlay table list. Go back to section 2.6.1 of this document and re-enter all the parameters saved from the SERV45 list in the old control.

12. Press the hidden SERVICE button and perform the SERV97 procedure to store the new parameters so they will not be lost when the power is turned off.

13. Press the hidden SERVICE button and select the SERV51-SPD CAL function—press ENTER to select the function, but DO NOT follow the prompts on the screen regarding the CYCLE START button. Instead, press the hidden SERVICE button again, and now select the SERV97 function and store the cleared speed calibration data.

14. Press the hidden SERVICE button and access the SERV78-CUSTOM AUX code conversion table. Go back to section 3.1.1 and re-enter all the data saved for the Custom AUX table from the old control. The procedure would be to press the ENTER button to get to the next AUX location, then press ENTER again to access the TVVFF entry screen. Enter the TVVFF code saved from the old control (32005) and press ENTER. You can scroll back to a previous entry to check it if desired.

15. The control should now be operational. Turn on the servo drives and test the motion of the machine. See the manual that came with this update kit for details on the new setup parameters for help in adjusting the machine's performance.

8. Appendix A – DIP Switch settings for older Burny 2.5 Front Panels

Older front panels for the Burny 2.5, as well as several of the private labeled versions did not include the 4 Directional JOG ARROWS as shown in the pictures. These panels used a sequence of pressing the II button, then used the numbered keyboard to select the jog direction.

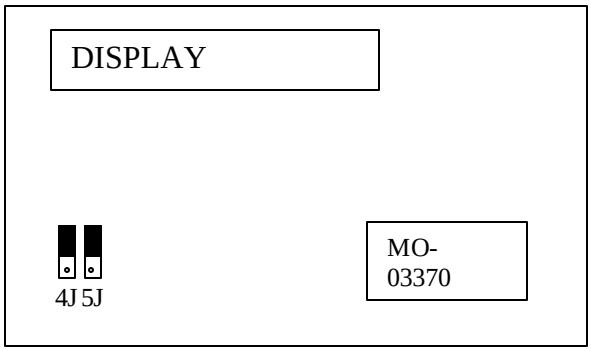
To configure the new MO-12438 board to work correctly with these older panels, the DIP switches must be set to match the configuration jumpers from the old boards.

DIP switch settings for MO-03370 processor card replacement

SW1 – ON
SW2 – OFF
SW3 – OFF
SW4 – Set to ON if Jumper 4J is set AWAY from the display.
Set to OFF if Jumper 4J is set TOWARD the display.

SW5 – Set to ON if Jumper 5J is set AWAY from the display.
Set to OFF if Jumper 5J is set TOWARD the display.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-04873 or MO-04875 processor card replacement

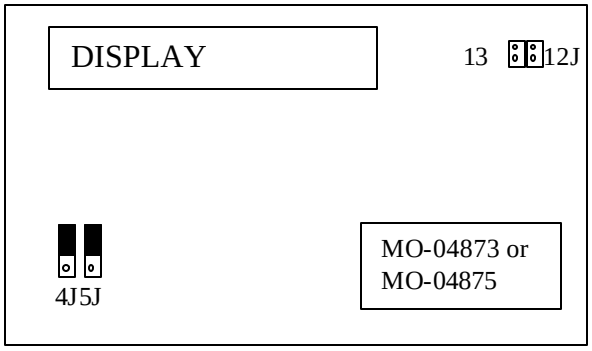
SW1 – ON
SW2 – Set to OFF if Jumper 12J is missing,
Set to ON if jumper J12 is installed

SW3 – Set to OFF if Jumper 13J is missing,
Set to ON if jumper J13 is installed

SW4 – Set to ON if Jumper 4J is set AWAY from the readout.
Set to OFF if Jumper 4J is set TOWARD the readout.

SW5 – Set to ON if Jumper 5J is set AWAY from the readout.
Set to OFF if Jumper 5J is set TOWARD the readout.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-08601 or MO-11249 processor card replacement

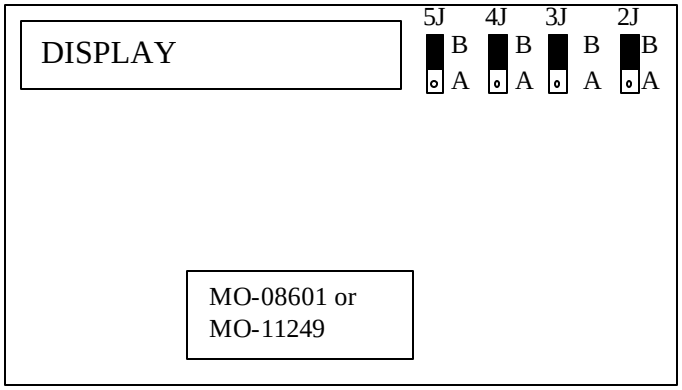
SW1 – ON
SW2– Set to OFF if Jumper J2 is set to “A”,
Set to ON if Jumper J2 is set to “B”

SW3– Set to OFF if Jumper J3 is set to “A”,
Set to ON if Jumper J3 is set to “B”

SW4– Set to OFF if Jumper J4 is set to “A”,
Set to ON if Jumper J4 is set to “B”

SW5– Set to OFF if Jumper J5 is set to “A”,
Set to ON if Jumper J5 is set to “B”

SW6, SW7, SW8 – All set to OFF



9. Appendix B – Changes to Encoder Scaling for older 2.5 updates

The older MO-03370, MO-04873 and MO-04875 processor cards included hardware jumpers J6 thru J9 on the card. These were used to tolerate faster encoder counting frequencies that could not be handled by the hardware. The newer 2.5 processor cards use faster encoder counting circuitry and eliminated these jumpers.

If one of these older boards (3370,4873,4875) are being replaced, the setting of these jumpers can affect the parameters entered into the new MO-12438 card.

If all 4 of the jumpers J6,J7,J8 and J9 are set toward the display (See Fig. 1), then the setup parameters from the old board can be directly entered into the new card.

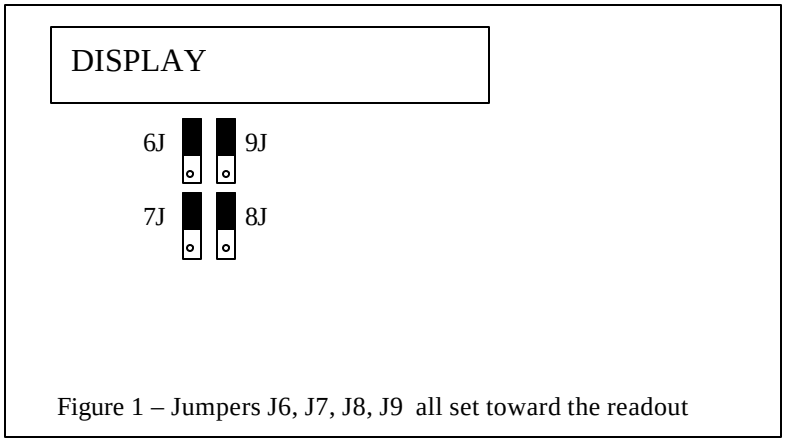


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

Some installations may be using faster encoders, particularly motor mounted encoders, and may have these jumpers set the opposite direction. If all 4 of the jumpers J6,J7, J8, J9 (Figure 2) are set away from the DISPLAY, then the value recorded for parameter SD22- ENC LINES/REV must be multiplied by 4. So for example, a system where the old card had a setting of 500 for SD22 would need to have 2000 entered into the new MO-12438 to work properly.

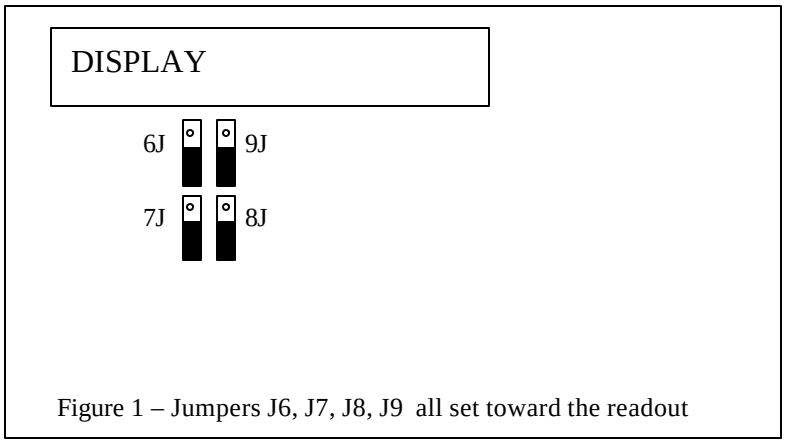


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

If the old system has jumpers J6, J7, J8, J9 set to any other random pattern, contact the factory since this will require modifying several of the system parameters. This is very uncommon.

10. Appendix C "Burny 2.5 Plus-- New features and Capabilities"

The goal of the 2.5 Plus development program was to produce a new version of the computer board in the Burny 2.5 series products that would improve the speed and system performance, without affecting the basic operation. The 2.5 Plus processor card will perform RS-232 downloads, and the Kerf calculations 80-90% faster than the older cards.

Most of the prompting, displays and operator inputs are exactly the same as the older cards—so there is little or no re-training required when the new 2.5 Plus card is substituted for an older card. However, there is the problem that the 2.5 Plus basically copies the operation of the Burny 2.5 software that was in existence at the end of 1999. If the older 2.5 card had software dating back many years (could go back as far as 1988), then there will be substantial differences in the machine's operation due to the changes and improvements that have occurred over the years of software development on the Burny 2.5 product line. This may require some additional training for the operators to become familiar with the new operation of the control, and the new capabilities available to the operator. See the new OPERATION MANUAL supplied along with this Burny 2.5 Plus product for details on all the current features of the product.

The two main areas where a difference will be noted are in the Serial I/O downloading speeds, and the Kerf processing speed.

Kerf Processing speed

The Kerf process is self contained within the Burny 2.5 Plus—there is no interaction with the outside world so the process can function at peak efficiency.

Serial I/O Downloading Speed

The Serial I/O downloading is a different matter. Since the Serial I/O communication via the RS-232/422 port connects to devices outside the Burny product, the performance of the downloading system is very dependent on the performance and setting of the external devices. For example, if the existing cutting machine had the BAUD rate set to 2400 Baud for the serial downloading speed, there will be NO increase in performance of the Serial Downloading speed with the Burny 2.5 Plus—the older card work just as well at 2400 baud as the new 2.5 Plus card. To fully take advantage of the new downloading speed capacity of the Burny 2.5 Plus card, the external system must be capable of supplying the data faster also. The following is an ESTIMATE of the speed improvement expected for various Baud rate settings of the Burny 2.5 Plus. Note that the higher baud rate settings were not even possible with the older Burny 2.5 which was normally used up to about 4800 baud.

Serial I/O Downloading Baud Rate setting	ESTIMATED speed improvement with Burny 2.5 Plus.
300 to 2400 Baud	0%-- Same speed as older card
4800 Baud	25% Less time for download
9600 Baud	60% Less time for download
19.2K Baud	80% Less time for download
28.8K Baud	80% Less time for download
38.4K Baud	75% Less time for download
57.6K to 230K Baud	60-75% Less time—note that these very high baud rates require more system overhead and are actually LESS EFFICIENT than the somewhat slower settings from 19.2K to 38.4K Baud

Serial Number and Option codes

The Burny 2.5 Plus software does not use Option codes—all possible features for the product are available as Standard capabilities with every system that ships. Similarly, there is no longer a SERIAL NUMBER imbedded into the product—the display will show " SERIAL 0" for all Burny 2.5 Plus products. The main purpose for the Serial number was to control the software lockout codes for the options—no more options means no more serial number.

The fact that all Options are now standard will cause some new menus and displays to show up on older controls where a particular option was missing before. For example, if an older Burny 2.8 did not have the STANDARD SHAPES option installed, there would not have been a menu choice for "LOAD-STANDARD SHAPE" in the select function list. When the 2.5 Plus card is installed, the operator will now see this "LOAD- STANDARD SHAPE" prompt – this should be explained to the operator ahead of time to avoid possible confusion.

The following is a list of the features that will now appear on all controls—the ones marked ** may have been missing from the older card—they are now provided as a standard capability of the new Burny 2.5 Plus software:

- RUN- PROGRAM
- LOAD- FROM STD SHAPE ** (Older card required Standard Shape option to be enabled)
- LOAD- FROM RS-232 ** (Older card required Serial I/O Option to be enabled)
- STORE- TO RS-232 ** (Older card required Serial I/O Option to be enabled)
- TEACH- PROGRAM ** (Older card required Teach Option to be enabled)
- DELETE-PROGRAM
- EDIT-PROGRAM ** (Very old cards could only access EDIT via DSPY20-)
- LOAD- FROM FLOPPY ** (Older cards required Floppy option to be enabled)
- STORE- TO FLOPPY ** (Older cards required Floppy option to be enabled)
- LOAD/RUN- RS-232 ** (Older cards required Serial I/O option to be enabled)
- LOAD/RUN-FLOPPY ** (Older cards required Floppy option to be enabled)

Some operators may complain that they have to Scroll through too many choices in this new expanded list of features to get what they want. Remember that these choices can be made with a single button push as described in the operation manual— as a reminder, the following number keys select the indicted function:

- RUN- PROGRAM -- Press the number 1 on the keypad
- LOAD- FROM STD SHAPE -- Press the number 2 on the keypad
- LOAD- FROM RS-232 -- Press the number 3 on the keypad
- STORE- TO RS-232 -- Press the number 4 on the keypad
- TEACH- PROGRAM -- Press the number 5 on the keypad
- DELETE-PROGRAM -- Press the number 6 on the keypad
- EDIT-PROGRAM -- Press the number 7 on the keypad
- LOAD- FROM FLOPPY -- Press the number +/- on the keypad
- STORE- TO FLOPPY -- Press the number . (decimal point) on the keypad
- LOAD/RUN- RS-232 -- Press the number 3, then the SHF on the keypad
- LOAD/RUN-FLOPPY -- Press the +/- key, then the SHF on the keypad

Blank

Burny 2.5 PLUS Update

Installation instructions for field upgrades using the Burny 2.5 PLUS processor card.

Also for use with MO-12685 and MO-12742 upgrade kits

ECO REVISION HISTORY

Revision	*Description*	*ECO*	*Date*
-AA	Written	---	28-July-00
-BA	Add photos, DIP Switch and parameter for old cards	CLE1716	07-Dec-00

Spec No.:	*Division:* BURNY
Author: RDM	*Rev:* **BA**
File name: AO-90177BA.doc	*Date:* **7-Dec-2000**

Cleveland Motion Controls
An IMC Company

REVISION HISTORY

Rev AA	RDM (28-July-2000) -- Written
Rev BA	JRB (7-Dec-2000) -- Added retrofit Figures and references
	RDM(7-Dec-2000) -- Add APPENDIX A,B for Dip switch settings for older front panels, and APPENDIX B for modifications needed to Encoder Scaling parameters when MO-3370 or 4873 or 4875 board was replaced.

TABLE OF CONTENTS

1. INTRODUCTION

These instructions document the steps needed to update existing Burny 2.5 controls, or any of the other Series 2 controls (1250,1400, 2.8, 2.9) with the new MO-12438 Burny 2.5 Plus processor card. The procedure assumes the installer is familiar with the Burny products and is capable of the mechanical assembly/disassembly and entry of parameters into the system.

For updates on a Burny 1250 or Burny 1400 system, the original keyboard can still be used—just the processor card is replaced as described in the following procedures.

For Burny 2.5, Burny 2.8 or Burny 2.9 systems, a special part number MO-12685 has been created to provide a new processor card with the new 2.5 Plus keyboard. This is necessary since the older Burny 2.5 keyboards do not have the proper clearance in the aluminum panel for the current readout used on the Burny 2.5 products. By ordering this MO-12685 kit, the installer is assured of having a panel that works fits the readout.

The main purpose of this particular procedure is to document all of the stored parameters, option codes, Aux code conversion tables, etc. which are configured in the existing Series 2 control BEFORE the new processor card is installed. Once the new card is operational, this stored data from the old system will be re-entered with the goal of making the new card capable of running the machine in as little time as possible.

2. PARAMETER and SYSTEM DATA RETRIEVAL

Before disassembling anything, the installer must first retrieve all the data stored in the existing Burny 2.5 system. There is no automatic way to do this with the older software, therefore the data must be manually obtained. The following pages have procedures and tables to be used to write down the parameter data, Code Conversion table data, and options enabled in the current system. Then, after the new processor card and panel are installed, these values must be manually re-entered into the new system. If this process is done correctly, and attention is paid to getting the data correct, the new system should begin operation with no further tuning required.

2.1 System Data Parameters-SERV10

With the existing system operating normally, press the hidden "SERVICE" button and access SERV10-SYS DATA. Press ENTER to display the main system parameter list. The display shows the first parameter as:

SD01-ARC ON DELAY

Press the ENTER button a second time to display the value currently set for this parameter—if the Arc On delay had been set for 3 seconds, the display would now show:

AONDLY = 3.00

Write down this 3.00 value in the following table. Press the ENTER button to access the next parameter name, and then press the ENTER button a second time to access the value—the display would have showed:

SD02-BLEEDOFF then BLEDOF= 2.00 (2 seconds used for this example)

Continue stepping through the entire list of parameters and write their values in the able provided.

IMPORTANT: Older systems may not include all the parameters shown on this list.

Older systems had less parameters than the current Burny 2.5—therefore it is important to carefully pay attention to the parameter number displayed on the screen, and match it to the table before writing the value. Any parameters that were not included in the old system will be handled during the installation portion for the new card.

2.1.1 SERV10 PARAMETERS

Parameter Number and Name	PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN	Default value to be used for older systems where a parameter was not part of the older products list.	Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system
SD01- ARC ON TIME	ARCDLY =		
SD02- BLEEDOFF	BLEDOF =		
SD03- ACCEL TIME	ACCTME =		
SD04- MAX DRV SPD	MAXSPD =		
SD06- BACKUP SPD	BCKSPD =		
SD07- CORNER SPD	CORSPD =		
SD08- MIN HLD SPD	MINHLD =		
SD09- ERR SPD MAX	ERRSPD =	20 inch/min 400 mm/min	

SD10- RUNSPD LIMIT	RUNLMT =		
SD11- TRAVERS LMT	TRVLMT =		
SD12- MIN ACCEL	MIN ACCEL =	.20 seconds	
SD14- GAIN BREAK	GAIN BREAK =	0	
SD15- ERR WRN DST	WRNDST =		
SD16- LOOP GAIN	LPGAIN =		
SD17- ARC OFF DLY	AOFDLY =	2.0 seconds	
SD18- SLWDWN DIST	SLWDST =		
SD19- DISABL DIST	DISABL =	.25 inches 6.3 mm	
SD20- X ENC DIST	XENSCL =		
SD21- Y ENC DIST	YENSCL =		
SD22- ENC LIN/REV	ENC LINES =		
SD23- X ENC DIR	X ENC DIR -		
SD24- Y ENC DIR	Y ENC DIR -		
SD25- X DRV DIR	X DRV DIR -		
SD26- Y DRV DIR	Y DRV DIR -		
SD27- PLATE SIDE	PLATE ON -		
SD28- HEIGHT RLY	CONTACT -		
SD29- SLWDWN RAD	SLWRAD =		
SD30- MIN RAD SPD	MRADSP =	30 inches/min 150 mm/min	
SD31- PLASMA TB1	PLASMA TB1 =	NO	
SD32- MIN SLW ANG	MINSLW =	10	
SD33- MAX SLW ANG	MAXSLW =	22	
SD40- X MARK OFF	XOFST1 =		
SD41- Y MARK OFF	YOFST1 =		
SD42- MARKER SPD	MRKSPD =		
SD43- MARK DELAY	MRKDLY =		
SD45- DEFLT DWELL	DFDWEL =		
SD46- MIN OFF DWL	MINOFF =		
SD47- XOFST2	XOFST2 =		

SD48- YOFST2	YOFST2=		
SD49- START DELAY	STRDLY =	1.5 seconds	
SD50- SERIAL DEFN	SERIAL DEFN =		
SD5- PRGM FORMAT	PGMFMT =		
SD52- SPECIAL EOP	EOP 1 =		
SD53- FILE EXTEN	FEXTEN =	434E4300	
SD60- OPER SYS	OPER SYS =		
SD61- SYS CONFG 1	SYSCFG1 =		
SD62- SYS CONFG 2	SYSCFG2 =		
SD63- SYS CONFG 3	SYSCFG3 =	0	
SD65- OVERLAY CFG	OVERLAY CFG =	0	
SD68- SPEED RANGE	SPEED RANGE =	4	
SD69- LA NGUAGE	LANGUAGE =	0	
SD70- KNF ROT DIA	KNFDIA =		
SD71- KNF B.P. ANG	KNF B.P. ANG =		
SD74- T2XHOM	T2XHOM =		
SD75-T2YHOM	T2YHOM =		
SD76- T3XHOM	T3XHOM =		
SD77- T3YHOM	T3YHOM =		
SD78- T4XHOM	T4XHOM =		
SD79- T4YHOM	T4YHOM =		
SD80- XOFST1	XOFST1 =		
SD81- XOFST1	YOFST1 =		
SD82- XOFST2	XOFST2 =		
SD83- XOFST2	YOFST2 =		
SD84- XOFST3	XOFST3 =		
SD85- XOFST3	YOFST3 =		
SD86- XOFST4	XOFST4 =		
SD87- XOFST4	YOFST4 =		
SD88- XOFST5	XOFST5 =		

SD89- XOFST5	YOFST5 =		
SD90- XOFST6	XOFST6 =		
SD91- XOFST6	YOFST6 =		
SD92- XOFST7	XOFST7 =		
SD93- XOFST7	YOFST7 =		
SD94- XOFST8	XOFST8 =		
SD95- XOFST8	YOFST8 =		
SD96- XHOMSW	XHOMSW =		
SD97- XHOMSW	YHOMSW =		
SDA0- XBKLSH	XBKLSH =	0	
SDA1- YBKLSH	YBKLSH =	0	
SDA2- LSH RATE	LSH RATE =		
SDD0- SYNC W-AXIS	SYNC ENABLE =	NO	
SDD1- W GAIN	W GAIN =		
SDD2- SKEW LIMT	SKWLMT =		
SDD3- W MAX SPD	WMXSPD =		
SDD4- W ENC DIR	W ENCODER =		
SDD5- W DRV DIR	W DRIVE =		
SDD6- WBKLSH	WBKLSH =		
SDD7 – W OFFSET	WOFSET =		

2.2 System Overlay Table #1 Parameters - SERV41

Burny 2.5 systems built after 1983 had the 5 sets of additional setup parameters which could be selected by programming codes within a part program to "overlay" the standard SERV10 parameter list. Access this list of values by pressing the hidden "SERVICE" button and access SERV41-TB 1 DATA. Press ENTER to display the overlay table #1 list. Note this list is much shorter than the SERV10 list. Again, carefully step down through the list and write the values in the following list:

2.2.1 SERV41 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
1-03- ACCEL TIME	ACCTME =		
1-07- CORNER SPD	CORSPD =		
1-10- RUNSPD LIMIT	RUNLMT =		
1-12- MIN ACCEL	MIN ACCEL =		
1-14- GAIN BREAK	GAIN BREAK =		
1-16- LOOP GAIN	LPGAIN =		
1-18- SLWDWN DIST	SLWDST =		
1-19- DISABL DIST	DISABL =		
1-29- SLWDWN RAD	SLWRAD =		
1-30- MIN RAD SPD	MRADSP =		
1-32- MIN SLW ANG	MINSLW =		
1-33- MAX SLW ANG	MAXSLW =		
1-45- DEFLT DWELL	DFDWEL =		
1-46- MIN OFF DWL	MINOFF =		
1-49- START DELAY	STRDLY =		

2.3 System Overlay Table #2 Parameters - SERV42

Continue with this process to access the data in Overlay Table #2 by pressing the hidden "SERVICE" button and access SERV42-TB 2 DATA. Press ENTER to display the overlay table #2 list.

2.3.1 SERV42 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
2-03- ACCEL TIME	ACCTME =		
2-07- CORNER SPD	CORSPD =		
2-10- RUNSPD LIMIT	RUNLMT =		
2-12- MIN ACCEL	MIN ACCEL =		
2-14- GAIN BREAK	GAIN BREAK =		
2-16- LOOP GAIN	LPGAIN =		
2-18- SLWDWN DIST	SLWDST =		
2-19- DISABL DIST	DISABL =		
2-29- SLWDWN RAD	SLWRAD =		
2-30- MIN RAD SPD	MRADSP =		
2-32- MIN SLW ANG	MINSLW =		
2-33- MAX SLW ANG	MAXSLW =		
2-45- DEFLT DWELL	DFDWEL =		
2-46- MIN OFF DWL	MINOFF =		
2-49- START DELAY	STRDLY =		

2.4 System Overlay Table #3 Parameters - SERV43

Continue with this process to access the data in Overlay Table #3 by pressing the hidden "SERVICE" button and access SERV43-TB 3 DATA. Press ENTER to display the overlay table #3 list.

2.4.1 SERV43 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
3-03- ACCEL TIME	ACCTME =		
3-07- CORNER SPD	CORSPD =		
3-10- RUNSPD LIMIT	RUNLMT =		
3-12- MIN ACCEL	MIN ACCEL =		
3-14- GAIN BREAK	GAIN BREAK =		
3-16- LOOP GAIN	LPGAIN =		
3-18- SLWDWN DIST	SLWDST =		
3-19- DISABL DIST	DISABL =		
3-29- SLWDWN RAD	SLWRAD =		
3-30- MIN RAD SPD	MRADSP =		
3-32- MIN SLW ANG	MINSLW =		
3-33- MAX SLW ANG	MAXSLW =		
3-45- DEFLT DWELL	DFDWEL =		
3-46- MIN OFF DWL	MINOFF =		
3-49- START DELAY	STRDLY =		

2.5 System Overlay Table #4 Parameters - SERV44

Continue with this process to access the data in Overlay Table #4 by pressing the hidden "SERVICE" button and access SERV44-TB 4 DATA. Press ENTER to display the overlay table #4 list.

2.5.1 SERV44 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
4-03- ACCEL TIME	ACCTME =		
4-07- CORNER SPD	CORSPD =		
4-10- RUNSPD LIMIT	RUNLMT =		
4-12- MIN ACCEL	MIN ACCEL =		
4-14- GAIN BREAK	GAIN BREAK =		
4-16- LOOP GAIN	LPGAIN =		
4-18- SLWDWN DIST	SLWDST =		
4-19- DISABL DIST	DISABL =		
4-29- SLWDWN RAD	SLWRAD =		
4-30- MIN RAD SPD	MRADSP =		
4-32- MIN SLW ANG	MINSLW =		
4-33- MAX SLW ANG	MAXSLW =		
4-45- DEFLT DWELL	DFDWEL =		
4-46- MIN OFF DWL	MINOFF =		
4-49- START DELAY	STRDLY =		

2.6 System Overlay Table #5 Parameters - SERV45

Continue with this process to access the data in Overlay Table #5 by pressing the hidden "SERVICE" button and access SERV45-TB 5 DATA. Press ENTER to display the overlay table #5 list.

2.6.1 SERV54 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
5-03- ACCEL TIME	ACCTME =		
5-07- CORNER SPD	CORSPD =		
5-10- RUNSPD LIMIT	RUNLMT =		
5-12- MIN ACCEL	MIN ACCEL =		
5-14- GAIN BREAK	GAIN BREAK =		
5-16- LOOP GAIN	LPGAIN =		
5-18- SLWDWN DIST	SLWDST =		
5-19- DISABL DIST	DISABL =		
5-29- SLWDWN RAD	SLWRAD =		
5-30- MIN RAD SPD	MRADSP =		
5-32- MIN SLW ANG	MINSLW =		
5-33- MAX SLW ANG	MAXSLW =		
5-45- DEFLT DWELL	DFDWEL =		
5-46- MIN OFF DWL	MINOFF =		
5-49- START DELAY	STRDLY =		

3. Retrieving Custom Aux Table Data – SERV78

The Burny 2.5 has the ability to convert the M and G or ESSI auxiliary functions in a part program into the functional codes needed by the Burny to cut the part. The data for making this conversion is contained in a list accessed by pressing the hidden "SERVICE" button, and then selecting the SERV78-CUSTOM AUX utility. Press ENTER to access the first entry in the list. There are 2 display formats used with this list—when the table is first accessed, the display will be in the "Table position" mode which shows which of the 50 possible entries is being displayed, and the current setting for that table location:

AUX01-M20-CUTOFF

This indicates that the first table location "AUX01" contains the data to convert an M20 code from a word address program into an internal Cut Off function—turn the oxygen or plasma off at the end of a cut.

Pressing ENTER at this point changes the display to show the TVVFF code for the AUX01 entry—the display will appear as:

32005-M20-CUTOFF

The 32005 is the TVVFF code:

T -- a single digit that defines the type of code begin converted (1-ESSI, 2-G code, 3-M code)

VV – a 2 or 3 digit value (up to 127) that defines the numeric value for the code (20 in this example)

FF – a 2 digit code defining the internal function assigned to the code (see Burny 2.5 manual for the list)

It is NOT necessary to understand what all these codes do to install the Burny 2.5 Plus processor card--- the important thing is to get them written down in the following chart so they can be re-entered in the new control.

The procedure would be to step through the list for each of the AUX entries and write down the data displayed for the block and the TVVFF displays.

While this list contains a maximum of 50 entries, the number of AUX table entries is usually much less. The end of the list is indicated by a display of a location being AVAILABLE. This means that no data has been entered for this table entry—the Burny will not search the table past this AVAILABLE location therefore any data following the first AVAILABLE location is not needed—it would not affect the controls operation in any way.

Begin stepping through the list and write down the data in the following chart:

3.1.1 AUX CODE TABLE DATA

Table location display: Example: AUX01 – M20 – CUT OFF	TVVFF display Example:32005 – M20 – CUT OFF
AUX01 -- --	-- --
AUX02 -- --	-- --
AUX03 -- --	-- --

AUX04	--	--	--	--
AUX05	--	--	--	--
AUX06	--	--	--	--
AUX07	--	--	--	--
AUX08	--	--	--	--
AUX09	--	--	--	--
AUX10	--	--	--	--
AUX11	--	--	--	--
AUX12	--	--	--	--
AUX13	--	--	--	--
AUX14	--	--	--	--
AUX15	--	--	--	--
AUX16	--	--	--	--
AUX17	--	--	--	--
AUX18	--	--		
AUX19	--	--		
AUX20	--	--		
AUX21	--	--		
AUX22	--	--		
AUX23	--	--		
AUX24	--	--		
AUX25	--	--		
AUX26	--	--		
AUX27	--	--		
AUX28	--	--		
AUX29	--	--		
AUX30	--	--		
AUX31	--	--		
AUX32	--	--	--	--
AUX33	--	--	--	--
AUX34	--	--	--	--
AUX35	--	--	--	--
AUX36	--	--	--	--

AUX37	--	--	--	--	
AUX38	--	--			
AUX39	--	--			
AUX40	--	--			
AUX41	--	--			
AUX42	--	--			
AUX43	--	--			
AUX44	--	--			
AUX45	--	--			
AUX46	--	--			
AUX47	--	--			
AUX48	--	--			
AUX49	--	--			
AUX50	--	--			

4. OPTION CODES

All of the Burny 2.5 and related Series 2 controls have various software options that are enabled by special "Lockout" codes based on the serial number of the control. While the new Burny 2.5 Plus card has all "options" now loaded as standard features, the Option Settings for the old board must be documented to determine some of the parameter settings on the new board.

There are two ways that this is done, depending on the age of the software in the existing control.

4.1 Option code display on very old systems.

Very old systems only display the options as a coded text string during power-up. The control will turn on and go through it's normal tests, and then display a text string as:

OPTN- C2D4007000

Each digit in this display references a particular option.

Turn the power Off, and back On to the control, and wait for this string to appear—then record the value in the following spaces (it may take several cycles of power Off/On to get the entire string written down correctly).

OPTN										

4.2 Option code display on newer Burny 2.5 (Series 2) systems

Controls with more recent software will have a display function called DSPY80 which tells the ON/OFF status of each option directly on the screen. Press the DSPY button and select DSPY80. When the ENTER button is pressed, the display will first show a sequence of values showing the serial number, hardware type and how much memory is used. Press the ENTER button during this sequence and the display will change to show:

OPTIONS

KERF --- ON or KERF --- OFF

Pressing enter will step down through this list and show the status of each option as ON or OFF. Record these values in the following chart for later use. Some of these options may not appear in the list since they are now considered "standard"—the chart has locations for them to make the recording process easier

4.2.1 Option ON/OFF status

OPTION NAME	ON/OFF
KERF	
SCALE	
ROTATE	
MIRROR	
PLATE ALIGN	
SERIAL COMM	
COMM ENHANCE	
CAD LINK	
PLATE MARKER	
STD. SHAPES	
TEACH	
KNIFE KERF	
CUSTOM AUX.	
LANGUAGE or individual language such as SPANISH, FRENCH, GERMAN, etc.	
FLOPPY DRIVE	
PRG. FDRT/KRF (programmable feedrate and kerf)	

5. BACKUP PART PROGRAMS

The final section of data that must be transferred from the existing Burny 2.5 to the new Burny 2.5 PLUS card are the stored part programs in the control. Part programs could have been created by either loading a Standard Shape, Template Teach, Downloading a program from the serial port or a Floppy, or creating a program using the Editor.

When the old processor card is removed from the system, these programs will be lost unless they are backed up to some external device. Some customers will already have all of their programs stored on the host computer, so there is no need to backup the data from the Burny 2.5. However, other customers will have programs created by template teach, that are only stored in the Burny 2.5's memory—these programs should be backed up if possible.

This can be done in two ways.

If the system is equipped with a serial port, and the external computing device can accept program uploads, use the STORE function in the Burny 2.5 to store to the RS-232 port and send all the internal programs up to the host computer.

If the system is equipped with an internal or external Floppy Disk drive, use the STORE function in the Burny 2.5 and store the programs to a series of floppy disks so they can be reloaded into the new card.

6. Power Off—Swap processor cards

Now that all the data from the existing Burny 2.5 processor card has either been stored to some external device, or recorded on this document on the lists provided, the old card can be removed, and the new card installed.

IMPORTANT: Remove all sources of AC power to the machine before performing any service work. The main power disconnect should be turned off and Locked in the OFF state to prevent someone from accidentally turning the power back on during the service operation.

WARNING: Proper handling procedures must be followed when installing the new MO-12438 Burny 2.5PLUS processor card. This card contains many high speed, high density electronic devices that can be damaged by STATIC ELECTRICITY caused by improper handling. Before removing the card from it's protective bag, the installing technician MUST use a grounded anti-static wrist strap connected to the machine chassis. All sources of STATIC ELECTRICITY should be removed from the area (any styrofoam, plastic packing material, bubble wrap, plastic paper sleeve protectors, etc). Once the board is removed from it's protective bag, it should be installed directly into the Burny system—do not lay it on a table or other surface that may not be grounded.

**The existing Burny 2.5 processor card should be placed back into the same protective anti-static bag after it is removed from the system. **

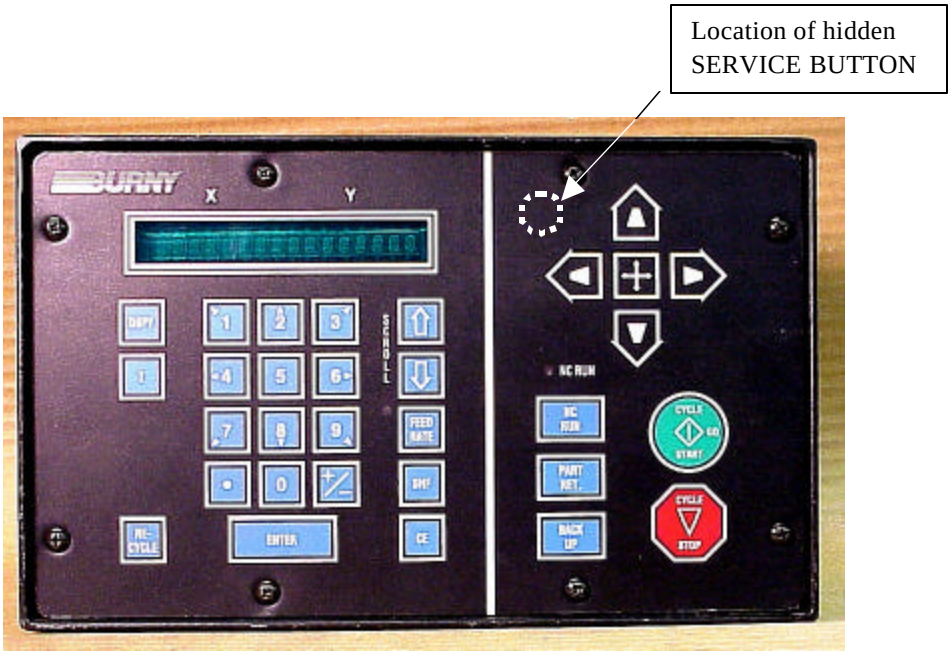


Figure 1- Typical Burny 2.5 Front Panel

Card installation:

1. Remove all sources of AC power to the machine, and lock-out the power disconnect to the machine to prevent accidental re-application of AC power during the service process.

2. Connect a grounded anti-static wrist strap to the machine frame and place it on the wrist of the installing technician.

3. Remove the screws holding the front panel of the product. For the Burny 2.5, these are the 8 screws around the keyboard panel. On the 1250 and 1400, there are 8 to 10 screws holding in the entire front hinged door. And finally, on the Burny 2.8, there are 22 screws holding the entire top cover of the cabinet—remove all but the bottom 4 screws along the lower front edge of the cabinet—just loosen the front 4 screws and lift the lid out of the slotted holes. See Figure 1.

4. Once the screws are removed, lay the front panel open so the screws holding the interface card to the processor card can be accessed.

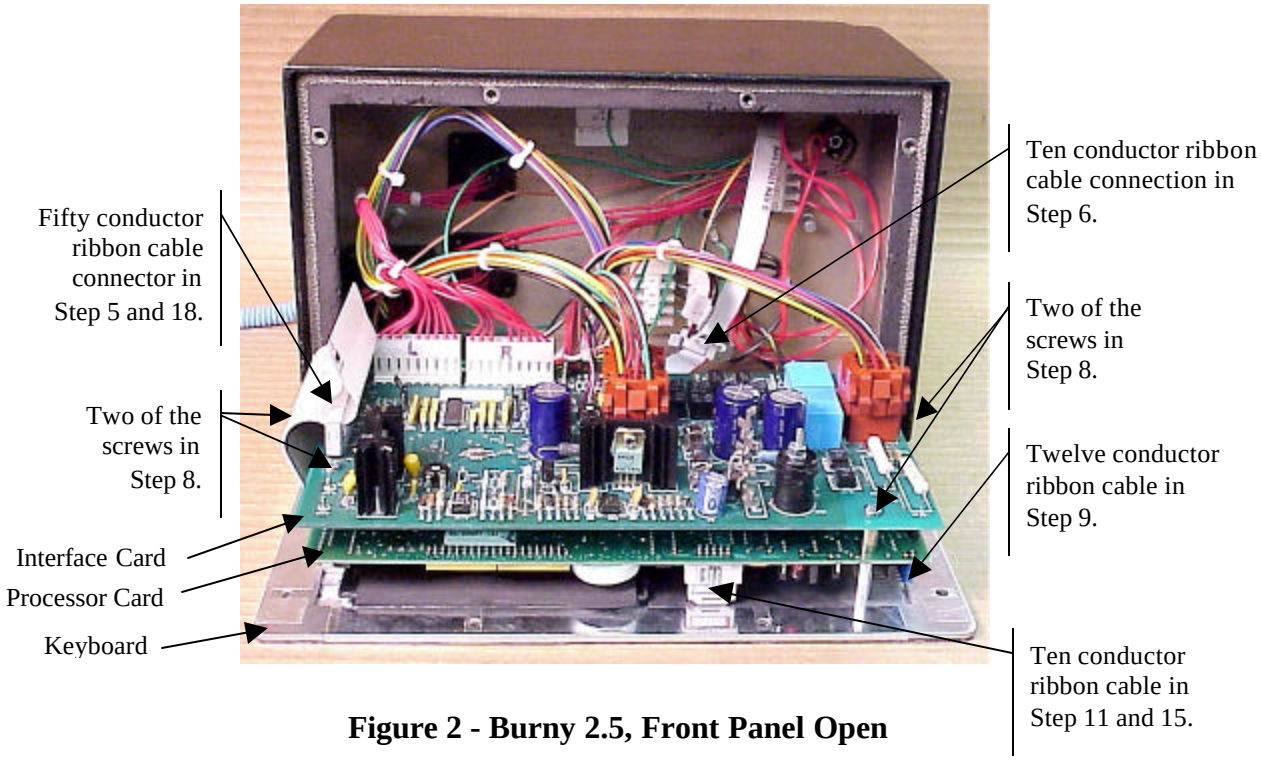


Figure 2 - Burny 2.5, Front Panel Open

5. Unplug the large 50 conductor ribbon cable that runs from the processor card to the interface card. See Figure 2.

6. Disconnect the 10 conductor ribbon cable from the processor card to the RS-232/422 modem. See Figure 2.

7. If installed, unplug the 14 conductor ribbon cable that runs from the processor card to the optional home limit switch input card used on some Burny 2.5 and 2.8 systems. See Figure 3.

8. Remove the 4 screws holding the interface card to the processor card in the system. This will make the interface and the processor card free floating so take care not to drop or stress the wires in the system during

this step. See Figure 2.

9. Lift the processor card slightly away from the keyboard panel, and unplug the 12 conductor ribbon that runs from the keyboard panel to the processor. See Figure 2.

10. Remove the old processor card from the system.

11. Remove the short 10 and/or 14 conductor ribbon cables from the old processor card—these will be re-used with the new card. See Figure 3.

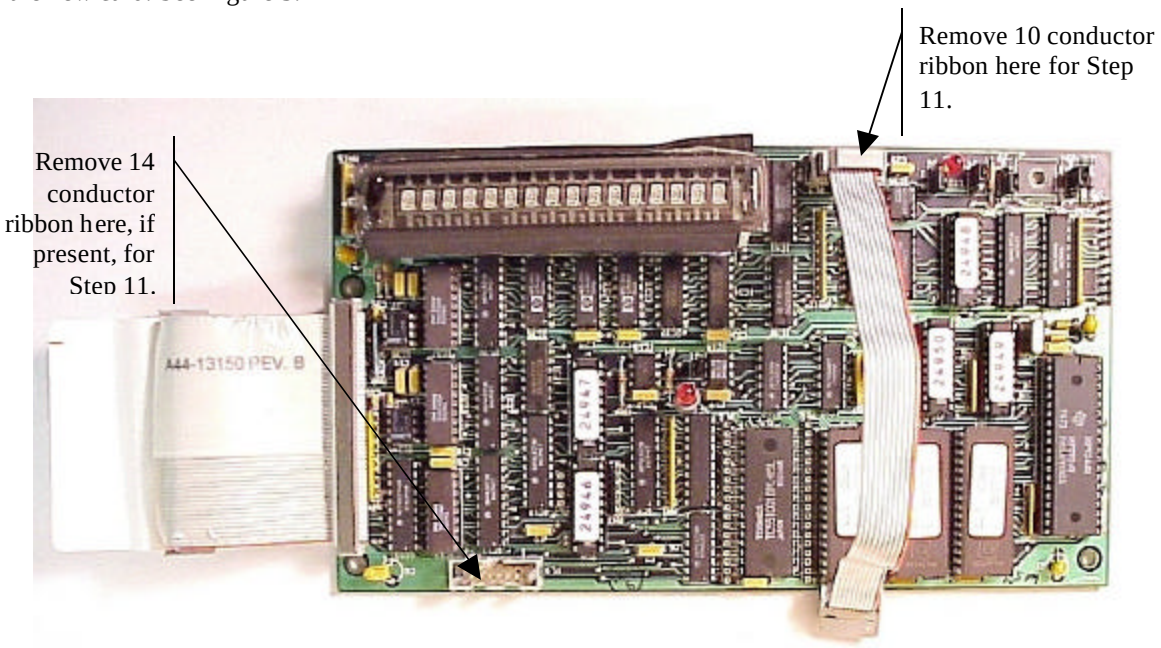


Figure 3 - Burny 2.5 Existing Processor Board

12. If a Burny 2.8 is being updated, remove the old keyboard by removing the 6 screws around the bezel on the front of the unit and discarding the old keyboard. Install the new keyboard supplied with the updated kit using the same screws and bezel as the old panel.

13. If a Burny 2.5 is being updated, discard the old keyboard. Use the new keyboard supplied with the update kit.

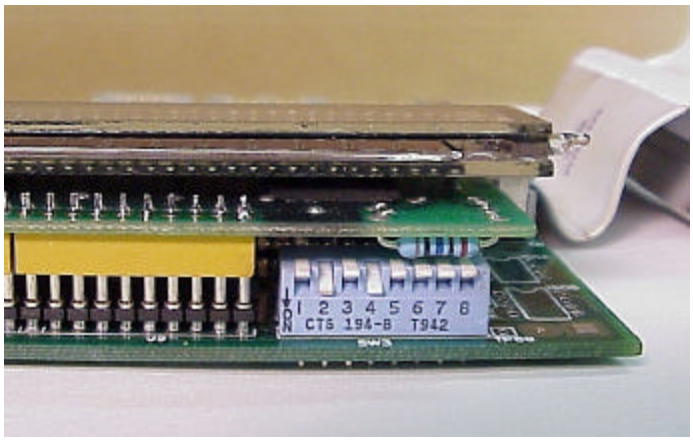


Figure 4 - DIP Switch in Step 14

14. Remove the new MO-12438 processor card from it's protective bag. See Figure 5 and 9. Set the DIP switch located on the new card under the readout as follows:

    - When using the MO-12438 card with any of the Burny 2.5 type keyboards that include the **4 DIRECTIONAL JOG ARROWS,** or with a **Burny 1250** or **Burny 1400** keyboard which also include the jog arrow buttons, the DIP switch on the MO-12438 **MUST** be set as follows:

      Position 1 -- OFF
      Position 2 -- ON
      Position 3 -- OFF
      Position 4 -- ON
      Position 5 -- OFF
      Position 6 -- OFF
      Position 7 -- OFF
      Position 8 -- OFF

      See Figure 4 -- these are the proper jumper settings when used with the new Burny 2.5 Plus front panel.

    - See APPENDIX A for details and precautions for using the MO-12438 card with older style Burny 2.5, 2.8 and private label keyboard panels.

15. Re-connect the 10 and/or 14 conductor ribbon cables to the new processor card—the connectors for these cables are located in almost the exact same location as the old card. Take care that the 10 pin cable for the serial RS-232/422 port is connected to the J4 connector on the new card. There is another 10 pin connector on the new processor card that will be used for software updates—but it will not function for the RS-232 port use. See Figure 5.

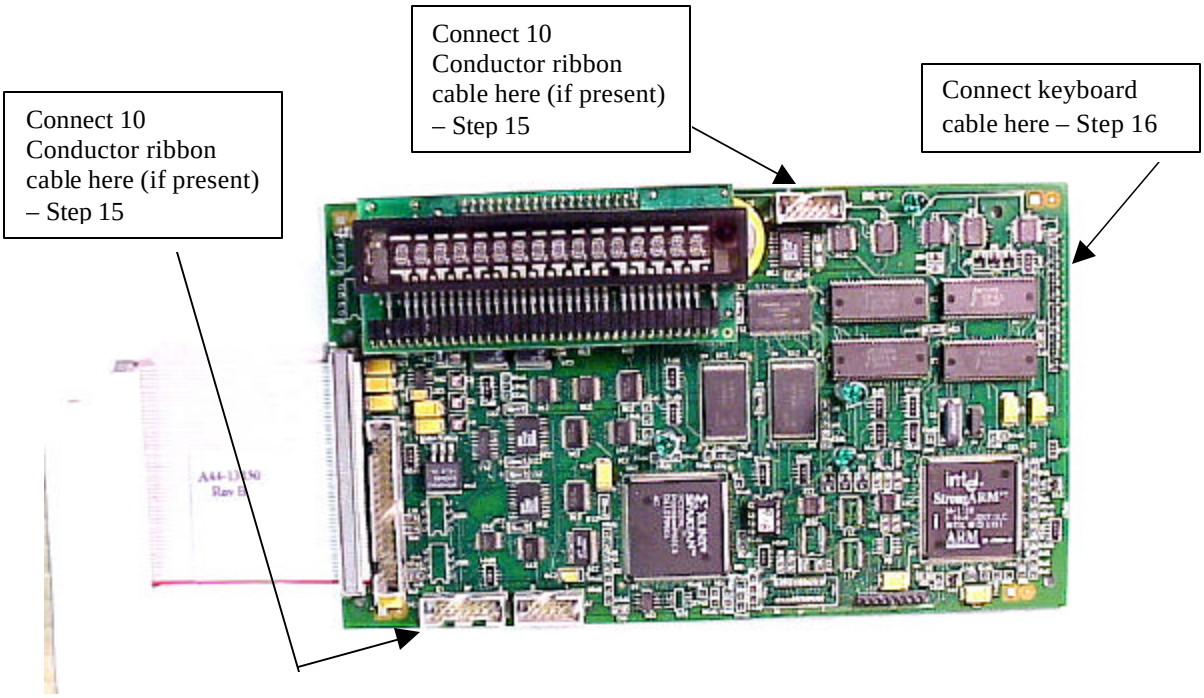


Figure 5 - Front of New Processor Board

16. Place the new MO-12438 card over the keyboard, and connect the ribbon from the keyboard to the J1 connector on the new processor card. Be sure to apply the ribbon connector starting at pin 1 of the J1 connector—the new processor card has some extra pins included in the J1 connector for future expansion—the older keyboards must be connected to the original 12 input pins. Also make sure the 10 or 14 conductor additional ribbon cables are routed under the card properly and are not pinched or interfering with the LED's or other devices.

17. Align the interface card and new processor over the keyboard standoffs, and replace the 4 screws to hold these two boards together.

18. Connect the 10, 14 and 50 conductor ribbon cables to their respective locations in the system. See Figure 2.

19. Replace the keyboard in the cabinet on 2.5 systems, close the door on the 1250/1400 or replace the 2.8's cabinet lid and replace the screws to hold in the panel or door. Make sure all screws are tight to insure a dust tight seal around the opening.

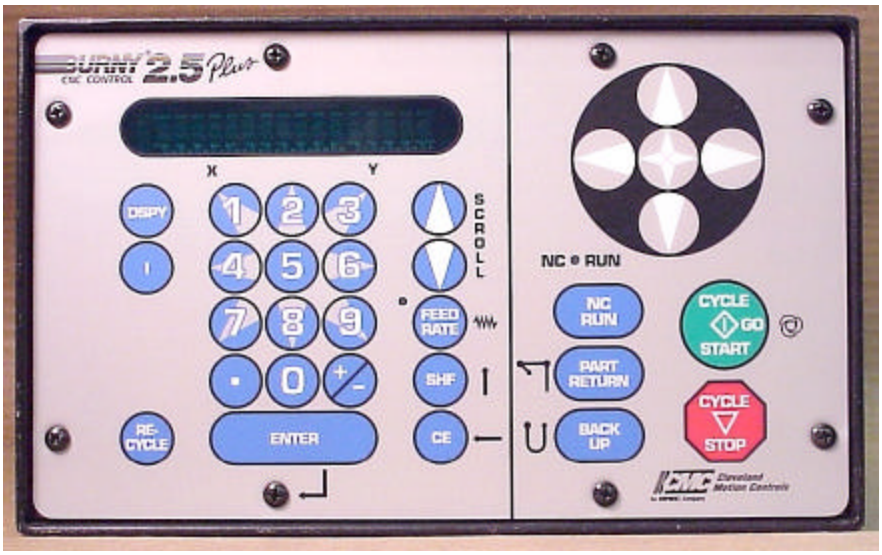


Figure 6 - Burny 2.5 *Plus* Front Panel

20. Remove the wrist strap now that the new card is installed and the cabinet is closed

21. Continue with this procedure to re-install all the data needed to make the new board function on the machine.

7. Power ON – Re-install saved data

Now that the mechanical installation of the new card is complete, the new card must be configured to run the system and act the same as the card that was removed. There will be some changes in the operation of the controls since you are updating the software to the most recent software version as a result of this card exchange. Consult the new Burny 2.5 operation manual supplied with the update kit for details on how to operate the new features.

1. Re-Apply AC power to the cutting machine and turn on the Burny system if there is a separate switch. The control should power up normally and display the familiar READY --- SELECT FUNCTION message.

2. DO NOT enable the servo drives for the system. If possible, disengage the pinion gears from the drive rack so that the machine. This is done as a precaution until it is confirmed that the parameters are working correctly in the new system.

3. Verify that the keyboard works properly. Try several operations to verify that most of the keys work correctly.

4. Press the hidden SERVICE button and select the SERV52- MEM RESET. Press ENTER and answer YES to both prompts to reset the program storage memory. After the process is done, use the DSPY80 function to display the amount of memory Used and Available. There should be almost 512K bytes available—this is the standard memory size on the MO-12438 Burny 2.5 Plus processor card.

5. Press the hidden SERVICE button and access the SERV10 parameter list. GO back to section 2.1.1 of this document and enter all the parameters in the SERV10 list. ALL PARAMETERS must be entered into the new card—do not skip any of the entries. If a value was not found in the old card, there is a suggested DEFAULT value in the table that should be entered into the new card. After the system is running, these new parameters may need to be re-adjusted to give optimal machine performance—see the new manual shipped with the update for details on the new parameter settings.

SPECIAL REQUIREMENTS FOR OLDER SYSTEMS

If the MO-12438 is being used to replace the older MO-03370, MO-4873, or MO-04875 processor cards—see APPENDIX B for information regarding the encoder scaling jumpers on these old cards, and how it affects the setup parameters

6. Refer back to Section 4 of this document where the OPTIONS from the old board were recorded. All of the features that used to be referred to as OPTIONS are now all STANDARD features in the Burny 2.5 Plus—there are no special option codes to enter. However, 2 of these old OPTION capabilities require a setting of one of the setup parameters to either ENABLE or DISABLE the feature.

COMM ENHANCE OPTION

Parameter SD51 now has a bit to control the COMM ENHANCE OPTION. This is an 8 digit parameter--for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the COMM ENHANCE option was ON with the old board, set digit D3 of the SD51 parameter to 0. (xx0xxxxx). This will cause the COMM ENHANCE to function on the new card.

- If the COMM ENHANCE option was OFF with the old board, set digit D3 of parameter SD51 to an "8" to disable the COMM ENHANCE feature on the new board— (xx8xxxxx).

KNIFE KERF OPTION

Parameter SD63 now has a bit to control the KNIFE KERF OPTION. Knife kerf is a special mode for the kerf routine that is used by the sign making industry for the special requirements of the drag knife used for cutting vinyl material, or for router cutting of plastic and aluminum for signs.

This is an 8 digit parameter-- for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the KNIFE KERF option was ON with the old board, set digit D3 of the SD63 parameter to a 1. (xx1xxxxx). This will cause the KNIFE KERF to function on the new card.

- If the KNIFE KERF option was OFF with the old board, set digit D3 of parameter SD51 to an "0" to disable the KNIFE KERF feature on the new board— (xx0xxxxx).

7. Press the hidden SERVICE button again, and access the SERV41 overlay table list. Go back to section 2.2.1 of this document and re-enter all the parameters saved from the SERV41 list in the old control.

8. Press the hidden SERVICE button again, and access the SERV42 overlay table list. Go back to section 2.3.1 of this document and re-enter all the parameters saved from the SERV42 list in the old control.

9. Press the hidden SERVICE button again, and access the SERV43 overlay table list. Go back to section 2.4.1 of this document and re-enter all the parameters saved from the SERV43 list in the old control.

10. Press the hidden SERVICE button again, and access the SERV44 overlay table list. Go back to section 2.5.1 of this document and re-enter all the parameters saved from the SERV44 list in the old control.

11. Press the hidden SERVICE button again, and access the SERV45 overlay table list. Go back to section 2.6.1 of this document and re-enter all the parameters saved from the SERV45 list in the old control.

12. Press the hidden SERVICE button and perform the SERV97 procedure to store the new parameters so they will not be lost when the power is turned off.

13. Press the hidden SERVICE button and select the SERV51-SPD CAL function—press ENTER to select the function, but DO NOT follow the prompts on the screen regarding the CYCLE START button. Instead, press the hidden SERVICE button again, and now select the SERV97 function and store the cleared speed calibration data.

14. Press the hidden SERVICE button and access the SERV78-CUSTOM AUX code conversion table. Go back to section 3.1.1 and re-enter all the data saved for the Custom AUX table from the old control. The procedure would be to press the ENTER button to get to the next AUX location, then press ENTER again to access the TVVFF entry screen. Enter the TVVFF code saved from the old control (32005) and press ENTER. You can scroll back to a previous entry to check it if desired.

15. The control should now be operational. Turn on the servo drives and test the motion of the machine. See the manual that came with this update kit for details on the new setup parameters for help in adjusting the machine's performance.

8. Appendix A – DIP Switch settings for older Burny 2.5 Front Panels

Older front panels for the Burny 2.5, as well as several of the private labeled versions did not include the 4 Directional JOG ARROWS as shown in the pictures. These panels used a sequence of pressing the II button, then used the numbered keyboard to select the jog direction.

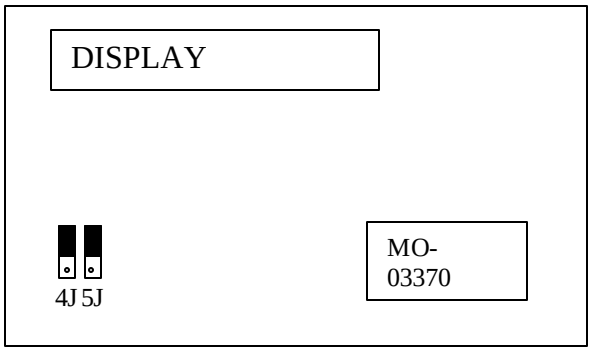
To configure the new MO-12438 board to work correctly with these older panels, the DIP switches must be set to match the configuration jumpers from the old boards.

DIP switch settings for MO-03370 processor card replacement

SW1 – ON
SW2 – OFF
SW3 – OFF
SW4 – Set to ON if Jumper 4J is set AWAY from the display.
Set to OFF if Jumper 4J is set TOWARD the display.

SW5 – Set to ON if Jumper 5J is set AWAY from the display.
Set to OFF if Jumper 5J is set TOWARD the display.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-04873 or MO-04875 processor card replacement

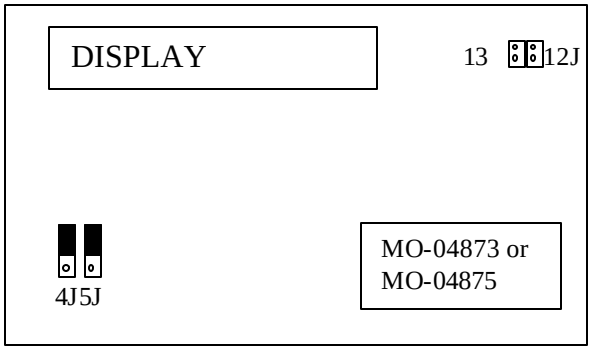
SW1 – ON
SW2 – Set to OFF if Jumper 12J is missing,
Set to ON if jumper J12 is installed

SW3 – Set to OFF if Jumper 13J is missing,
Set to ON if jumper J13 is installed

SW4 – Set to ON if Jumper 4J is set AWAY from the readout.
Set to OFF if Jumper 4J is set TOWARD the readout.

SW5 – Set to ON if Jumper 5J is set AWAY from the readout.
Set to OFF if Jumper 5J is set TOWARD the readout.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-08601 or MO-11249 processor card replacement

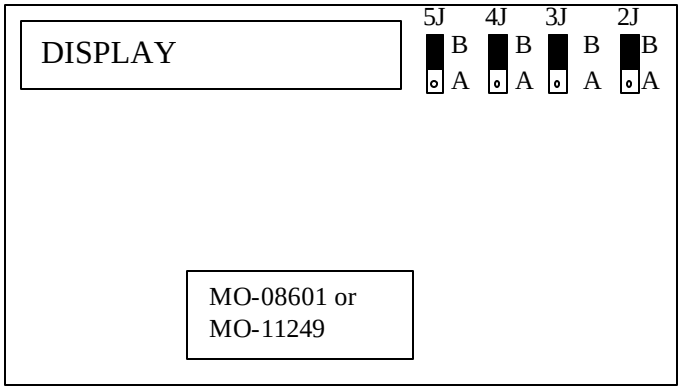
SW1 – ON
SW2– Set to OFF if Jumper J2 is set to “A”,
Set to ON if Jumper J2 is set to “B”

SW3– Set to OFF if Jumper J3 is set to “A”,
Set to ON if Jumper J3 is set to “B”

SW4– Set to OFF if Jumper J4 is set to “A”,
Set to ON if Jumper J4 is set to “B”

SW5– Set to OFF if Jumper J5 is set to “A”,
Set to ON if Jumper J5 is set to “B”

SW6, SW7, SW8 – All set to OFF



9. Appendix B – Changes to Encoder Scaling for older 2.5 updates

The older MO-03370, MO-04873 and MO-04875 processor cards included hardware jumpers J6 thru J9 on the card. These were used to tolerate faster encoder counting frequencies that could not be handled by the hardware. The newer 2.5 processor cards use faster encoder counting circuitry and eliminated these jumpers.

If one of these older boards (3370,4873,4875) are being replaced, the setting of these jumpers can affect the parameters entered into the new MO-12438 card.

If all 4 of the jumpers J6,J7,J8 and J9 are set toward the display (See Fig. 1), then the setup parameters from the old board can be directly entered into the new card.

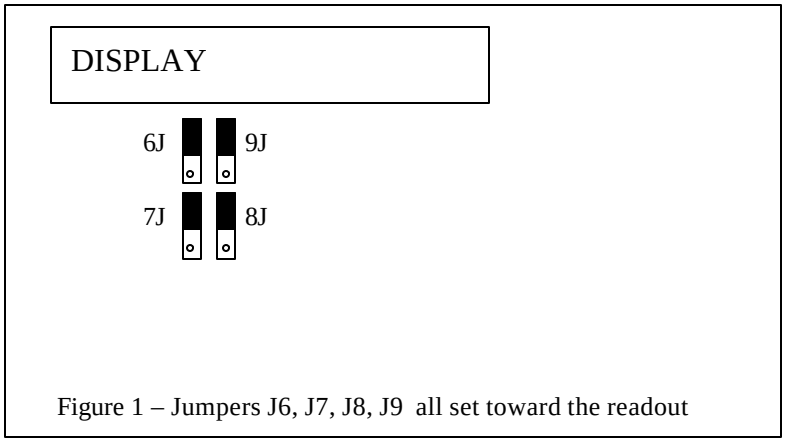


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

Some installations may be using faster encoders, particularly motor mounted encoders, and may have these jumpers set the opposite direction. If all 4 of the jumpers J6,J7, J8, J9 (Figure 2) are set away from the DISPLAY, then the value recorded for parameter SD22- ENC LINES/REV must be multiplied by 4. So for example, a system where the old card had a setting of 500 for SD22 would need to have 2000 entered into the new MO-12438 to work properly.

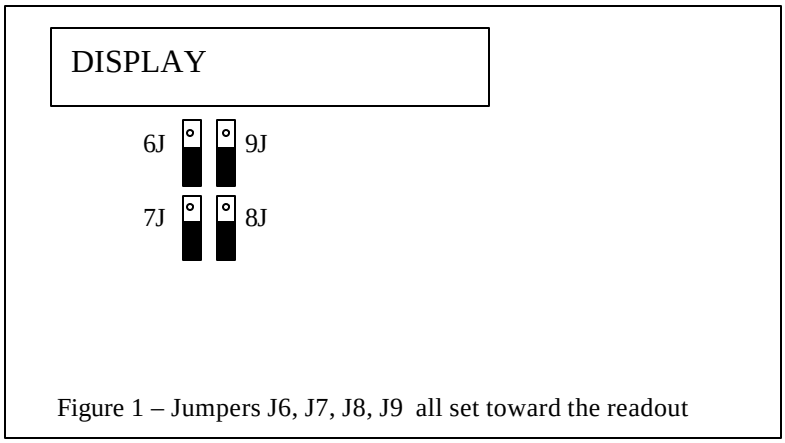


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

If the old system has jumpers J6, J7, J8, J9 set to any other random pattern, contact the factory since this will require modifying several of the system parameters. This is very uncommon.

10. Appendix C "Burny 2.5 Plus-- New features and Capabilities"

The goal of the 2.5 Plus development program was to produce a new version of the computer board in the Burny 2.5 series products that would improve the speed and system performance, without affecting the basic operation. The 2.5 Plus processor card will perform RS-232 downloads, and the Kerf calculations 80-90% faster than the older cards.

Most of the prompting, displays and operator inputs are exactly the same as the older cards—so there is little or no re-training required when the new 2.5 Plus card is substituted for an older card. However, there is the problem that the 2.5 Plus basically copies the operation of the Burny 2.5 software that was in existence at the end of 1999. If the older 2.5 card had software dating back many years (could go back as far as 1988), then there will be substantial differences in the machine's operation due to the changes and improvements that have occurred over the years of software development on the Burny 2.5 product line. This may require some additional training for the operators to become familiar with the new operation of the control, and the new capabilities available to the operator. See the new OPERATION MANUAL supplied along with this Burny 2.5 Plus product for details on all the current features of the product.

The two main areas where a difference will be noted are in the Serial I/O downloading speeds, and the Kerf processing speed.

Kerf Processing speed

The Kerf process is self contained within the Burny 2.5 Plus—there is no interaction with the outside world so the process can function at peak efficiency.

Serial I/O Downloading Speed

The Serial I/O downloading is a different matter. Since the Serial I/O communication via the RS-232/422 port connects to devices outside the Burny product, the performance of the downloading system is very dependent on the performance and setting of the external devices. For example, if the existing cutting machine had the BAUD rate set to 2400 Baud for the serial downloading speed, there will be NO increase in performance of the Serial Downloading speed with the Burny 2.5 Plus—the older card work just as well at 2400 baud as the new 2.5 Plus card. To fully take advantage of the new downloading speed capacity of the Burny 2.5 Plus card, the external system must be capable of supplying the data faster also. The following is an ESTIMATE of the speed improvement expected for various Baud rate settings of the Burny 2.5 Plus. Note that the higher baud rate settings were not even possible with the older Burny 2.5 which was normally used up to about 4800 baud.

Serial I/O Downloading Baud Rate setting	ESTIMATED speed improvement with Burny 2.5 Plus.
300 to 2400 Baud	0%-- Same speed as older card
4800 Baud	25% Less time for download
9600 Baud	60% Less time for download
19.2K Baud	80% Less time for download
28.8K Baud	80% Less time for download
38.4K Baud	75% Less time for download
57.6K to 230K Baud	60-75% Less time—note that these very high baud rates require more system overhead and are actually LESS EFFICIENT than the somewhat slower settings from 19.2K to 38.4K Baud

Serial Number and Option codes

The Burny 2.5 Plus software does not use Option codes—all possible features for the product are available as Standard capabilities with every system that ships. Similarly, there is no longer a SERIAL NUMBER imbedded into the product—the display will show " SERIAL 0" for all Burny 2.5 Plus products. The main purpose for the Serial number was to control the software lockout codes for the options—no more options means no more serial number.

The fact that all Options are now standard will cause some new menus and displays to show up on older controls where a particular option was missing before. For example, if an older Burny 2.8 did not have the STANDARD SHAPES option installed, there would not have been a menu choice for "LOAD-STANDARD SHAPE" in the select function list. When the 2.5 Plus card is installed, the operator will now see this "LOAD- STANDARD SHAPE" prompt – this should be explained to the operator ahead of time to avoid possible confusion.

The following is a list of the features that will now appear on all controls—the ones marked ** may have been missing from the older card—they are now provided as a standard capability of the new Burny 2.5 Plus software:

- RUN- PROGRAM
- LOAD- FROM STD SHAPE ** (Older card required Standard Shape option to be enabled)
- LOAD- FROM RS-232 ** (Older card required Serial I/O Option to be enabled)
- STORE- TO RS-232 ** (Older card required Serial I/O Option to be enabled)
- TEACH- PROGRAM ** (Older card required Teach Option to be enabled)
- DELETE-PROGRAM
- EDIT-PROGRAM ** (Very old cards could only access EDIT via DSPY20-)
- LOAD- FROM FLOPPY ** (Older cards required Floppy option to be enabled)
- STORE- TO FLOPPY ** (Older cards required Floppy option to be enabled)
- LOAD/RUN- RS-232 ** (Older cards required Serial I/O option to be enabled)
- LOAD/RUN-FLOPPY ** (Older cards required Floppy option to be enabled)

Some operators may complain that they have to Scroll through too many choices in this new expanded list of features to get what they want. Remember that these choices can be made with a single button push as described in the operation manual— as a reminder, the following number keys select the indicted function:

- RUN- PROGRAM -- Press the number 1 on the keypad
- LOAD- FROM STD SHAPE -- Press the number 2 on the keypad
- LOAD- FROM RS-232 -- Press the number 3 on the keypad
- STORE- TO RS-232 -- Press the number 4 on the keypad
- TEACH- PROGRAM -- Press the number 5 on the keypad
- DELETE-PROGRAM -- Press the number 6 on the keypad
- EDIT-PROGRAM -- Press the number 7 on the keypad
- LOAD- FROM FLOPPY -- Press the number +/- on the keypad
- STORE- TO FLOPPY -- Press the number . (decimal point) on the keypad
- LOAD/RUN- RS-232 -- Press the number 3, then the SHF on the keypad
- LOAD/RUN-FLOPPY -- Press the +/- key, then the SHF on the keypad

Blank

Burny 2.5 PLUS Update

Installation instructions for field upgrades using the Burny 2.5 PLUS processor card.

Also for use with MO-12685 and MO-12742 upgrade kits

ECO REVISION HISTORY

Revision	*Description*	*ECO*	*Date*
-AA	Written	---	28-July-00
-BA	Add photos, DIP Switch and parameter for old cards	CLE1716	07-Dec-00

Spec No.:	*Division:* BURNY
Author: RDM	*Rev:* **BA**
File name: AO-90177BA.doc	*Date:* **7-Dec-2000**

Cleveland Motion Controls
An IMC Company

REVISION HISTORY

Rev AA	RDM (28-July-2000) -- Written
Rev BA	JRB (7-Dec-2000) -- Added retrofit Figures and references
	RDM(7-Dec-2000) -- Add APPENDIX A,B for Dip switch settings for older front panels, and APPENDIX B for modifications needed to Encoder Scaling parameters when MO-3370 or 4873 or 4875 board was replaced.

TABLE OF CONTENTS

1. INTRODUCTION

These instructions document the steps needed to update existing Burny 2.5 controls, or any of the other Series 2 controls (1250,1400, 2.8, 2.9) with the new MO-12438 Burny 2.5 Plus processor card. The procedure assumes the installer is familiar with the Burny products and is capable of the mechanical assembly/disassembly and entry of parameters into the system.

For updates on a Burny 1250 or Burny 1400 system, the original keyboard can still be used—just the processor card is replaced as described in the following procedures.

For Burny 2.5, Burny 2.8 or Burny 2.9 systems, a special part number MO-12685 has been created to provide a new processor card with the new 2.5 Plus keyboard. This is necessary since the older Burny 2.5 keyboards do not have the proper clearance in the aluminum panel for the current readout used on the Burny 2.5 products. By ordering this MO-12685 kit, the installer is assured of having a panel that works fits the readout.

The main purpose of this particular procedure is to document all of the stored parameters, option codes, Aux code conversion tables, etc. which are configured in the existing Series 2 control BEFORE the new processor card is installed. Once the new card is operational, this stored data from the old system will be re-entered with the goal of making the new card capable of running the machine in as little time as possible.

2. PARAMETER and SYSTEM DATA RETRIEVAL

Before disassembling anything, the installer must first retrieve all the data stored in the existing Burny 2.5 system. There is no automatic way to do this with the older software, therefore the data must be manually obtained. The following pages have procedures and tables to be used to write down the parameter data, Code Conversion table data, and options enabled in the current system. Then, after the new processor card and panel are installed, these values must be manually re-entered into the new system. If this process is done correctly, and attention is paid to getting the data correct, the new system should begin operation with no further tuning required.

2.1 System Data Parameters-SERV10

With the existing system operating normally, press the hidden "SERVICE" button and access SERV10-SYS DATA. Press ENTER to display the main system parameter list. The display shows the first parameter as:

SD01-ARC ON DELAY

Press the ENTER button a second time to display the value currently set for this parameter—if the Arc On delay had been set for 3 seconds, the display would now show:

AONDLY = 3.00

Write down this 3.00 value in the following table. Press the ENTER button to access the next parameter name, and then press the ENTER button a second time to access the value—the display would have showed:

SD02-BLEEDOFF then BLEDOF= 2.00 (2 seconds used for this example)

Continue stepping through the entire list of parameters and write their values in the able provided.

IMPORTANT: Older systems may not include all the parameters shown on this list.

Older systems had less parameters than the current Burny 2.5—therefore it is important to carefully pay attention to the parameter number displayed on the screen, and match it to the table before writing the value. Any parameters that were not included in the old system will be handled during the installation portion for the new card.

2.1.1 SERV10 PARAMETERS

Parameter Number and Name	PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN	Default value to be used for older systems where a parameter was not part of the older products list.	Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system
SD01- ARC ON TIME	ARCDLY =		
SD02- BLEEDOFF	BLEDOF =		
SD03- ACCEL TIME	ACCTME =		
SD04- MAX DRV SPD	MAXSPD =		
SD06- BACKUP SPD	BCKSPD =		
SD07- CORNER SPD	CORSPD =		
SD08- MIN HLD SPD	MINHLD =		
SD09- ERR SPD MAX	ERRSPD =	20 inch/min 400 mm/min	

SD10- RUNSPD LIMIT	RUNLMT =		
SD11- TRAVERS LMT	TRVLMT =		
SD12- MIN ACCEL	MIN ACCEL =	.20 seconds	
SD14- GAIN BREAK	GAIN BREAK =	0	
SD15- ERR WRN DST	WRNDST =		
SD16- LOOP GAIN	LPGAIN =		
SD17- ARC OFF DLY	AOFDLY =	2.0 seconds	
SD18- SLWDWN DIST	SLWDST =		
SD19- DISABL DIST	DISABL =	.25 inches 6.3 mm	
SD20- X ENC DIST	XENSCL =		
SD21- Y ENC DIST	YENSCL =		
SD22- ENC LIN/REV	ENC LINES =		
SD23- X ENC DIR	X ENC DIR -		
SD24- Y ENC DIR	Y ENC DIR -		
SD25- X DRV DIR	X DRV DIR -		
SD26- Y DRV DIR	Y DRV DIR -		
SD27- PLATE SIDE	PLATE ON -		
SD28- HEIGHT RLY	CONTACT -		
SD29- SLWDWN RAD	SLWRAD =		
SD30- MIN RAD SPD	MRADSP =	30 inches/min 150 mm/min	
SD31- PLASMA TB1	PLASMA TB1 =	NO	
SD32- MIN SLW ANG	MINSLW =	10	
SD33- MAX SLW ANG	MAXSLW =	22	
SD40- X MARK OFF	XOFST1 =		
SD41- Y MARK OFF	YOFST1 =		
SD42- MARKER SPD	MRKSPD =		
SD43- MARK DELAY	MRKDLY =		
SD45- DEFLT DWELL	DFDWEL =		
SD46- MIN OFF DWL	MINOFF =		
SD47- XOFST2	XOFST2 =		

SD48- YOFST2	YOFST2=		
SD49- START DELAY	STRDLY =	1.5 seconds	
SD50- SERIAL DEFN	SERIAL DEFN =		
SD5- PRGM FORMAT	PGMFMT =		
SD52- SPECIAL EOP	EOP 1 =		
SD53- FILE EXTEN	FEXTEN =	434E4300	
SD60- OPER SYS	OPER SYS =		
SD61- SYS CONFG 1	SYSCFG1 =		
SD62- SYS CONFG 2	SYSCFG2 =		
SD63- SYS CONFG 3	SYSCFG3 =	0	
SD65- OVERLAY CFG	OVERLAY CFG =	0	
SD68- SPEED RANGE	SPEED RANGE =	4	
SD69- LA NGUAGE	LANGUAGE =	0	
SD70- KNF ROT DIA	KNFDIA =		
SD71- KNF B.P. ANG	KNF B.P. ANG =		
SD74- T2XHOM	T2XHOM =		
SD75-T2YHOM	T2YHOM =		
SD76- T3XHOM	T3XHOM =		
SD77- T3YHOM	T3YHOM =		
SD78- T4XHOM	T4XHOM =		
SD79- T4YHOM	T4YHOM =		
SD80- XOFST1	XOFST1 =		
SD81- XOFST1	YOFST1 =		
SD82- XOFST2	XOFST2 =		
SD83- XOFST2	YOFST2 =		
SD84- XOFST3	XOFST3 =		
SD85- XOFST3	YOFST3 =		
SD86- XOFST4	XOFST4 =		
SD87- XOFST4	YOFST4 =		
SD88- XOFST5	XOFST5 =		

SD89- XOFST5	YOFST5 =		
SD90- XOFST6	XOFST6 =		
SD91- XOFST6	YOFST6 =		
SD92- XOFST7	XOFST7 =		
SD93- XOFST7	YOFST7 =		
SD94- XOFST8	XOFST8 =		
SD95- XOFST8	YOFST8 =		
SD96- XHOMSW	XHOMSW =		
SD97- XHOMSW	YHOMSW =		
SDA0- XBKLSH	XBKLSH =	0	
SDA1- YBKLSH	YBKLSH =	0	
SDA2- LSH RATE	LSH RATE =		
SDD0- SYNC W-AXIS	SYNC ENABLE =	NO	
SDD1- W GAIN	W GAIN =		
SDD2- SKEW LIMT	SKWLMT =		
SDD3- W MAX SPD	WMXSPD =		
SDD4- W ENC DIR	W ENCODER =		
SDD5- W DRV DIR	W DRIVE =		
SDD6- WBKLSH	WBKLSH =		
SDD7 – W OFFSET	WOFSET =		

2.2 System Overlay Table #1 Parameters - SERV41

Burny 2.5 systems built after 1983 had the 5 sets of additional setup parameters which could be selected by programming codes within a part program to "overlay" the standard SERV10 parameter list. Access this list of values by pressing the hidden "SERVICE" button and access SERV41-TB 1 DATA. Press ENTER to display the overlay table #1 list. Note this list is much shorter than the SERV10 list. Again, carefully step down through the list and write the values in the following list:

2.2.1 SERV41 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
1-03- ACCEL TIME	ACCTME =		
1-07- CORNER SPD	CORSPD =		
1-10- RUNSPD LIMIT	RUNLMT =		
1-12- MIN ACCEL	MIN ACCEL =		
1-14- GAIN BREAK	GAIN BREAK =		
1-16- LOOP GAIN	LPGAIN =		
1-18- SLWDWN DIST	SLWDST =		
1-19- DISABL DIST	DISABL =		
1-29- SLWDWN RAD	SLWRAD =		
1-30- MIN RAD SPD	MRADSP =		
1-32- MIN SLW ANG	MINSLW =		
1-33- MAX SLW ANG	MAXSLW =		
1-45- DEFLT DWELL	DFDWEL =		
1-46- MIN OFF DWL	MINOFF =		
1-49- START DELAY	STRDLY =		

2.3 System Overlay Table #2 Parameters - SERV42

Continue with this process to access the data in Overlay Table #2 by pressing the hidden "SERVICE" button and access SERV42-TB 2 DATA. Press ENTER to display the overlay table #2 list.

2.3.1 SERV42 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
2-03- ACCEL TIME	ACCTME =		
2-07- CORNER SPD	CORSPD =		
2-10- RUNSPD LIMIT	RUNLMT =		
2-12- MIN ACCEL	MIN ACCEL =		
2-14- GAIN BREAK	GAIN BREAK =		
2-16- LOOP GAIN	LPGAIN =		
2-18- SLWDWN DIST	SLWDST =		
2-19- DISABL DIST	DISABL =		
2-29- SLWDWN RAD	SLWRAD =		
2-30- MIN RAD SPD	MRADSP =		
2-32- MIN SLW ANG	MINSLW =		
2-33- MAX SLW ANG	MAXSLW =		
2-45- DEFLT DWELL	DFDWEL =		
2-46- MIN OFF DWL	MINOFF =		
2-49- START DELAY	STRDLY =		

2.4 System Overlay Table #3 Parameters - SERV43

Continue with this process to access the data in Overlay Table #3 by pressing the hidden "SERVICE" button and access SERV43-TB 3 DATA. Press ENTER to display the overlay table #3 list.

2.4.1 SERV43 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
3-03- ACCEL TIME	ACCTME =		
3-07- CORNER SPD	CORSPD =		
3-10- RUNSPD LIMIT	RUNLMT =		
3-12- MIN ACCEL	MIN ACCEL =		
3-14- GAIN BREAK	GAIN BREAK =		
3-16- LOOP GAIN	LPGAIN =		
3-18- SLWDWN DIST	SLWDST =		
3-19- DISABL DIST	DISABL =		
3-29- SLWDWN RAD	SLWRAD =		
3-30- MIN RAD SPD	MRADSP =		
3-32- MIN SLW ANG	MINSLW =		
3-33- MAX SLW ANG	MAXSLW =		
3-45- DEFLT DWELL	DFDWEL =		
3-46- MIN OFF DWL	MINOFF =		
3-49- START DELAY	STRDLY =		

2.5 System Overlay Table #4 Parameters - SERV44

Continue with this process to access the data in Overlay Table #4 by pressing the hidden "SERVICE" button and access SERV44-TB 4 DATA. Press ENTER to display the overlay table #4 list.

2.5.1 SERV44 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
4-03- ACCEL TIME	ACCTME =		
4-07- CORNER SPD	CORSPD =		
4-10- RUNSPD LIMIT	RUNLMT =		
4-12- MIN ACCEL	MIN ACCEL =		
4-14- GAIN BREAK	GAIN BREAK =		
4-16- LOOP GAIN	LPGAIN =		
4-18- SLWDWN DIST	SLWDST =		
4-19- DISABL DIST	DISABL =		
4-29- SLWDWN RAD	SLWRAD =		
4-30- MIN RAD SPD	MRADSP =		
4-32- MIN SLW ANG	MINSLW =		
4-33- MAX SLW ANG	MAXSLW =		
4-45- DEFLT DWELL	DFDWEL =		
4-46- MIN OFF DWL	MINOFF =		
4-49- START DELAY	STRDLY =		

2.6 System Overlay Table #5 Parameters - SERV45

Continue with this process to access the data in Overlay Table #5 by pressing the hidden "SERVICE" button and access SERV45-TB 5 DATA. Press ENTER to display the overlay table #5 list.

2.6.1 SERV54 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
5-03- ACCEL TIME	ACCTME =		
5-07- CORNER SPD	CORSPD =		
5-10- RUNSPD LIMIT	RUNLMT =		
5-12- MIN ACCEL	MIN ACCEL =		
5-14- GAIN BREAK	GAIN BREAK =		
5-16- LOOP GAIN	LPGAIN =		
5-18- SLWDWN DIST	SLWDST =		
5-19- DISABL DIST	DISABL =		
5-29- SLWDWN RAD	SLWRAD =		
5-30- MIN RAD SPD	MRADSP =		
5-32- MIN SLW ANG	MINSLW =		
5-33- MAX SLW ANG	MAXSLW =		
5-45- DEFLT DWELL	DFDWEL =		
5-46- MIN OFF DWL	MINOFF =		
5-49- START DELAY	STRDLY =		

3. Retrieving Custom Aux Table Data – SERV78

The Burny 2.5 has the ability to convert the M and G or ESSI auxiliary functions in a part program into the functional codes needed by the Burny to cut the part. The data for making this conversion is contained in a list accessed by pressing the hidden "SERVICE" button, and then selecting the SERV78-CUSTOM AUX utility. Press ENTER to access the first entry in the list. There are 2 display formats used with this list—when the table is first accessed, the display will be in the "Table position" mode which shows which of the 50 possible entries is being displayed, and the current setting for that table location:

AUX01-M20-CUTOFF

This indicates that the first table location "AUX01" contains the data to convert an M20 code from a word address program into an internal Cut Off function—turn the oxygen or plasma off at the end of a cut.

Pressing ENTER at this point changes the display to show the TVVFF code for the AUX01 entry—the display will appear as:

32005-M20-CUTOFF

The 32005 is the TVVFF code:

T -- a single digit that defines the type of code begin converted (1-ESSI, 2-G code, 3-M code)

VV – a 2 or 3 digit value (up to 127) that defines the numeric value for the code (20 in this example)

FF – a 2 digit code defining the internal function assigned to the code (see Burny 2.5 manual for the list)

It is NOT necessary to understand what all these codes do to install the Burny 2.5 Plus processor card--- the important thing is to get them written down in the following chart so they can be re-entered in the new control.

The procedure would be to step through the list for each of the AUX entries and write down the data displayed for the block and the TVVFF displays.

While this list contains a maximum of 50 entries, the number of AUX table entries is usually much less. The end of the list is indicated by a display of a location being AVAILABLE. This means that no data has been entered for this table entry—the Burny will not search the table past this AVAILABLE location therefore any data following the first AVAILABLE location is not needed—it would not affect the controls operation in any way.

Begin stepping through the list and write down the data in the following chart:

3.1.1 AUX CODE TABLE DATA

Table location display: Example: AUX01 – M20 – CUT OFF	TVVFF display Example:32005 – M20 – CUT OFF
AUX01 -- --	-- --
AUX02 -- --	-- --
AUX03 -- --	-- --

AUX04	--	--	--	--
AUX05	--	--	--	--
AUX06	--	--	--	--
AUX07	--	--	--	--
AUX08	--	--	--	--
AUX09	--	--	--	--
AUX10	--	--	--	--
AUX11	--	--	--	--
AUX12	--	--	--	--
AUX13	--	--	--	--
AUX14	--	--	--	--
AUX15	--	--	--	--
AUX16	--	--	--	--
AUX17	--	--	--	--
AUX18	--	--		
AUX19	--	--		
AUX20	--	--		
AUX21	--	--		
AUX22	--	--		
AUX23	--	--		
AUX24	--	--		
AUX25	--	--		
AUX26	--	--		
AUX27	--	--		
AUX28	--	--		
AUX29	--	--		
AUX30	--	--		
AUX31	--	--		
AUX32	--	--	--	--
AUX33	--	--	--	--
AUX34	--	--	--	--
AUX35	--	--	--	--
AUX36	--	--	--	--

AUX37	--	--	--	--	
AUX38	--	--			
AUX39	--	--			
AUX40	--	--			
AUX41	--	--			
AUX42	--	--			
AUX43	--	--			
AUX44	--	--			
AUX45	--	--			
AUX46	--	--			
AUX47	--	--			
AUX48	--	--			
AUX49	--	--			
AUX50	--	--			

4. OPTION CODES

All of the Burny 2.5 and related Series 2 controls have various software options that are enabled by special "Lockout" codes based on the serial number of the control. While the new Burny 2.5 Plus card has all "options" now loaded as standard features, the Option Settings for the old board must be documented to determine some of the parameter settings on the new board.

There are two ways that this is done, depending on the age of the software in the existing control.

4.1 Option code display on very old systems.

Very old systems only display the options as a coded text string during power-up. The control will turn on and go through it's normal tests, and then display a text string as:

OPTN- C2D4007000

Each digit in this display references a particular option.

Turn the power Off, and back On to the control, and wait for this string to appear—then record the value in the following spaces (it may take several cycles of power Off/On to get the entire string written down correctly).

OPTN										

4.2 Option code display on newer Burny 2.5 (Series 2) systems

Controls with more recent software will have a display function called DSPY80 which tells the ON/OFF status of each option directly on the screen. Press the DSPY button and select DSPY80. When the ENTER button is pressed, the display will first show a sequence of values showing the serial number, hardware type and how much memory is used. Press the ENTER button during this sequence and the display will change to show:

OPTIONS

KERF --- ON or KERF --- OFF

Pressing enter will step down through this list and show the status of each option as ON or OFF. Record these values in the following chart for later use. Some of these options may not appear in the list since they are now considered "standard"—the chart has locations for them to make the recording process easier

4.2.1 Option ON/OFF status

OPTION NAME	ON/OFF
KERF	
SCALE	
ROTATE	
MIRROR	
PLATE ALIGN	
SERIAL COMM	
COMM ENHANCE	
CAD LINK	
PLATE MARKER	
STD. SHAPES	
TEACH	
KNIFE KERF	
CUSTOM AUX.	
LANGUAGE or individual language such as SPANISH, FRENCH, GERMAN, etc.	
FLOPPY DRIVE	
PRG. FDRT/KRF (programmable feedrate and kerf)	

5. BACKUP PART PROGRAMS

The final section of data that must be transferred from the existing Burny 2.5 to the new Burny 2.5 PLUS card are the stored part programs in the control. Part programs could have been created by either loading a Standard Shape, Template Teach, Downloading a program from the serial port or a Floppy, or creating a program using the Editor.

When the old processor card is removed from the system, these programs will be lost unless they are backed up to some external device. Some customers will already have all of their programs stored on the host computer, so there is no need to backup the data from the Burny 2.5. However, other customers will have programs created by template teach, that are only stored in the Burny 2.5's memory—these programs should be backed up if possible.

This can be done in two ways.

If the system is equipped with a serial port, and the external computing device can accept program uploads, use the STORE function in the Burny 2.5 to store to the RS-232 port and send all the internal programs up to the host computer.

If the system is equipped with an internal or external Floppy Disk drive, use the STORE function in the Burny 2.5 and store the programs to a series of floppy disks so they can be reloaded into the new card.

6. Power Off—Swap processor cards

Now that all the data from the existing Burny 2.5 processor card has either been stored to some external device, or recorded on this document on the lists provided, the old card can be removed, and the new card installed.

IMPORTANT: Remove all sources of AC power to the machine before performing any service work. The main power disconnect should be turned off and Locked in the OFF state to prevent someone from accidentally turning the power back on during the service operation.

WARNING: Proper handling procedures must be followed when installing the new MO-12438 Burny 2.5PLUS processor card. This card contains many high speed, high density electronic devices that can be damaged by STATIC ELECTRICITY caused by improper handling. Before removing the card from it's protective bag, the installing technician MUST use a grounded anti-static wrist strap connected to the machine chassis. All sources of STATIC ELECTRICITY should be removed from the area (any styrofoam, plastic packing material, bubble wrap, plastic paper sleeve protectors, etc). Once the board is removed from it's protective bag, it should be installed directly into the Burny system—do not lay it on a table or other surface that may not be grounded.

**The existing Burny 2.5 processor card should be placed back into the same protective anti-static bag after it is removed from the system. **

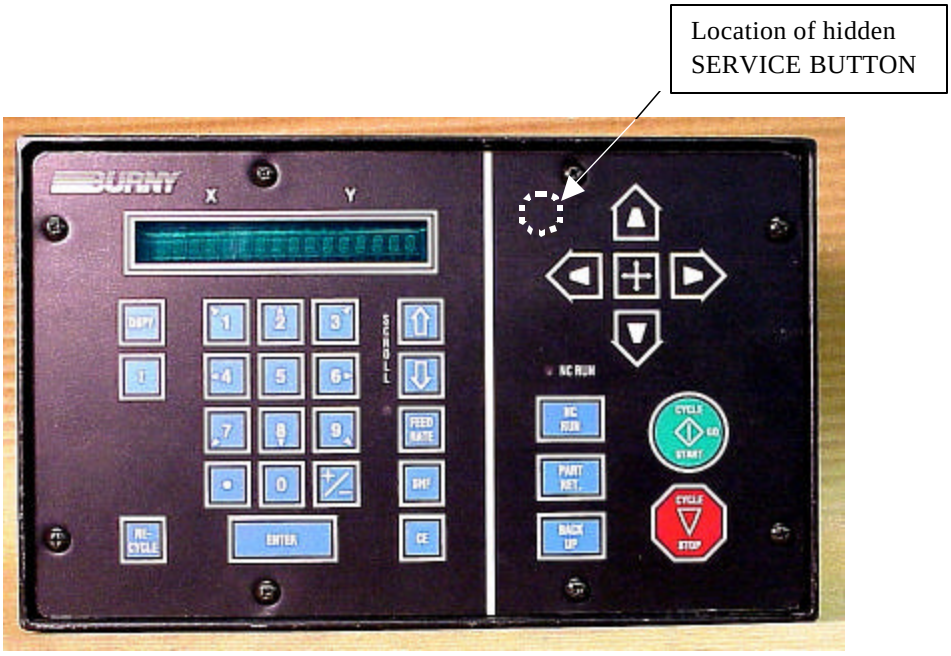


Figure 1- Typical Burny 2.5 Front Panel

Card installation:

1. Remove all sources of AC power to the machine, and lock-out the power disconnect to the machine to prevent accidental re-application of AC power during the service process.

2. Connect a grounded anti-static wrist strap to the machine frame and place it on the wrist of the installing technician.

3. Remove the screws holding the front panel of the product. For the Burny 2.5, these are the 8 screws around the keyboard panel. On the 1250 and 1400, there are 8 to 10 screws holding in the entire front hinged door. And finally, on the Burny 2.8, there are 22 screws holding the entire top cover of the cabinet—remove all but the bottom 4 screws along the lower front edge of the cabinet—just loosen the front 4 screws and lift the lid out of the slotted holes. See Figure 1.

4. Once the screws are removed, lay the front panel open so the screws holding the interface card to the processor card can be accessed.

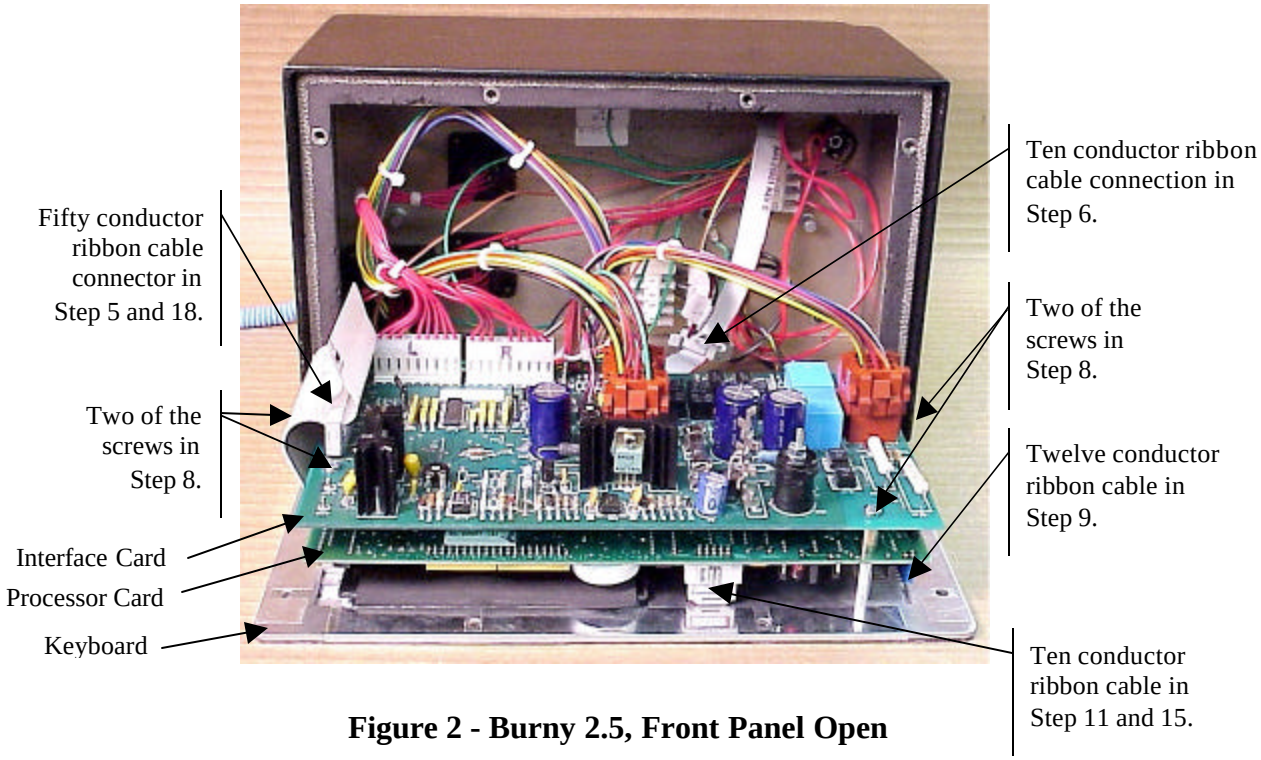


Figure 2 - Burny 2.5, Front Panel Open

5. Unplug the large 50 conductor ribbon cable that runs from the processor card to the interface card. See Figure 2.

6. Disconnect the 10 conductor ribbon cable from the processor card to the RS-232/422 modem. See Figure 2.

7. If installed, unplug the 14 conductor ribbon cable that runs from the processor card to the optional home limit switch input card used on some Burny 2.5 and 2.8 systems. See Figure 3.

8. Remove the 4 screws holding the interface card to the processor card in the system. This will make the interface and the processor card free floating so take care not to drop or stress the wires in the system during

this step. See Figure 2.

9. Lift the processor card slightly away from the keyboard panel, and unplug the 12 conductor ribbon that runs from the keyboard panel to the processor. See Figure 2.

10. Remove the old processor card from the system.

11. Remove the short 10 and/or 14 conductor ribbon cables from the old processor card—these will be re-used with the new card. See Figure 3.

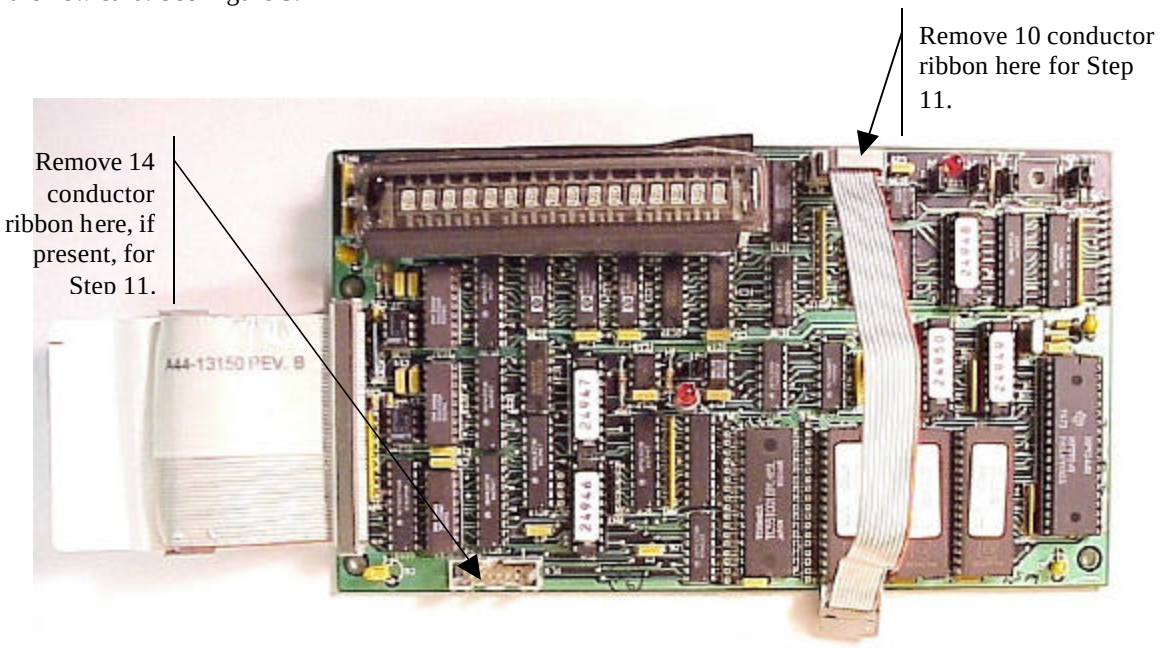


Figure 3 - Burny 2.5 Existing Processor Board

12. If a Burny 2.8 is being updated, remove the old keyboard by removing the 6 screws around the bezel on the front of the unit and discarding the old keyboard. Install the new keyboard supplied with the updated kit using the same screws and bezel as the old panel.

13. If a Burny 2.5 is being updated, discard the old keyboard. Use the new keyboard supplied with the update kit.

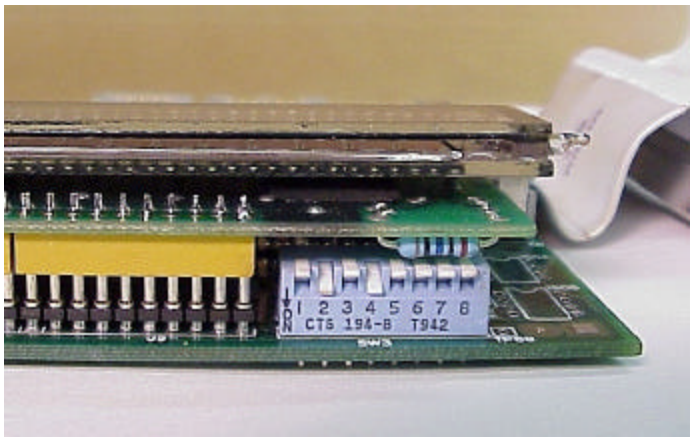


Figure 4 - DIP Switch in Step 14

14. Remove the new MO-12438 processor card from it's protective bag. See Figure 5 and 9. Set the DIP switch located on the new card under the readout as follows:

    - When using the MO-12438 card with any of the Burny 2.5 type keyboards that include the **4 DIRECTIONAL JOG ARROWS,** or with a **Burny 1250** or **Burny 1400** keyboard which also include the jog arrow buttons, the DIP switch on the MO-12438 **MUST** be set as follows:

      Position 1 -- OFF
      Position 2 -- ON
      Position 3 -- OFF
      Position 4 -- ON
      Position 5 -- OFF
      Position 6 -- OFF
      Position 7 -- OFF
      Position 8 -- OFF

      See Figure 4 -- these are the proper jumper settings when used with the new Burny 2.5 Plus front panel.

    - See APPENDIX A for details and precautions for using the MO-12438 card with older style Burny 2.5, 2.8 and private label keyboard panels.

15. Re-connect the 10 and/or 14 conductor ribbon cables to the new processor card—the connectors for these cables are located in almost the exact same location as the old card. Take care that the 10 pin cable for the serial RS-232/422 port is connected to the J4 connector on the new card. There is another 10 pin connector on the new processor card that will be used for software updates—but it will not function for the RS-232 port use. See Figure 5.

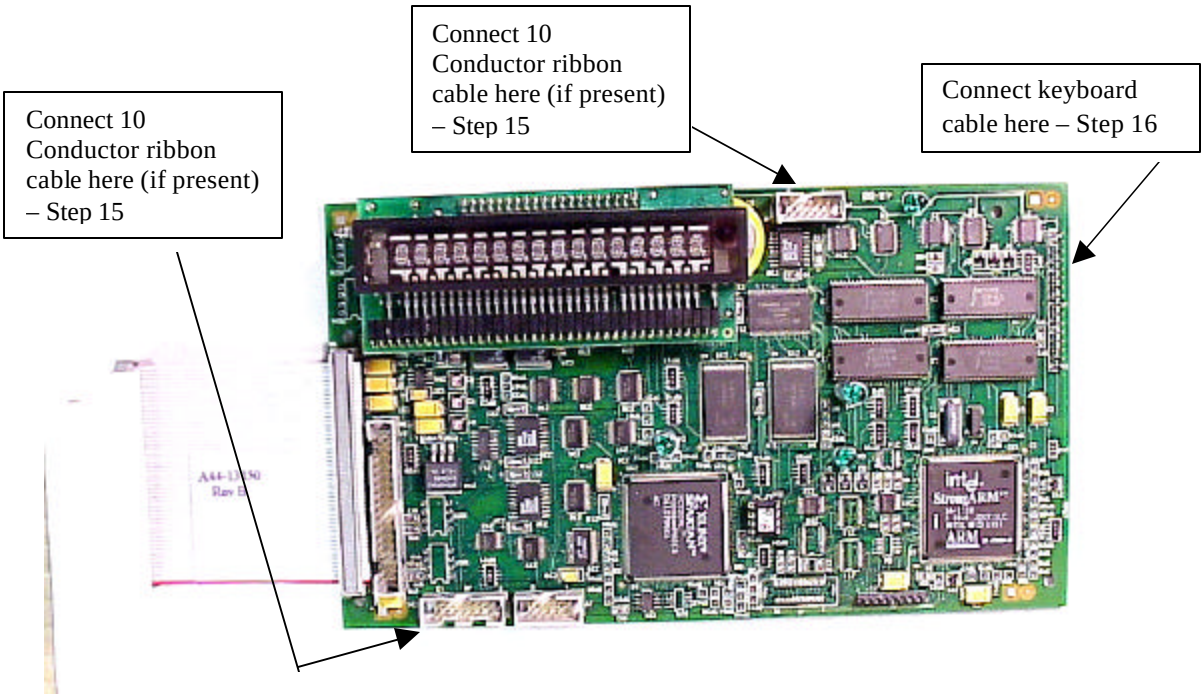


Figure 5 - Front of New Processor Board

16. Place the new MO-12438 card over the keyboard, and connect the ribbon from the keyboard to the J1 connector on the new processor card. Be sure to apply the ribbon connector starting at pin 1 of the J1 connector—the new processor card has some extra pins included in the J1 connector for future expansion—the older keyboards must be connected to the original 12 input pins. Also make sure the 10 or 14 conductor additional ribbon cables are routed under the card properly and are not pinched or interfering with the LED's or other devices.

17. Align the interface card and new processor over the keyboard standoffs, and replace the 4 screws to hold these two boards together.

18. Connect the 10, 14 and 50 conductor ribbon cables to their respective locations in the system. See Figure 2.

19. Replace the keyboard in the cabinet on 2.5 systems, close the door on the 1250/1400 or replace the 2.8's cabinet lid and replace the screws to hold in the panel or door. Make sure all screws are tight to insure a dust tight seal around the opening.

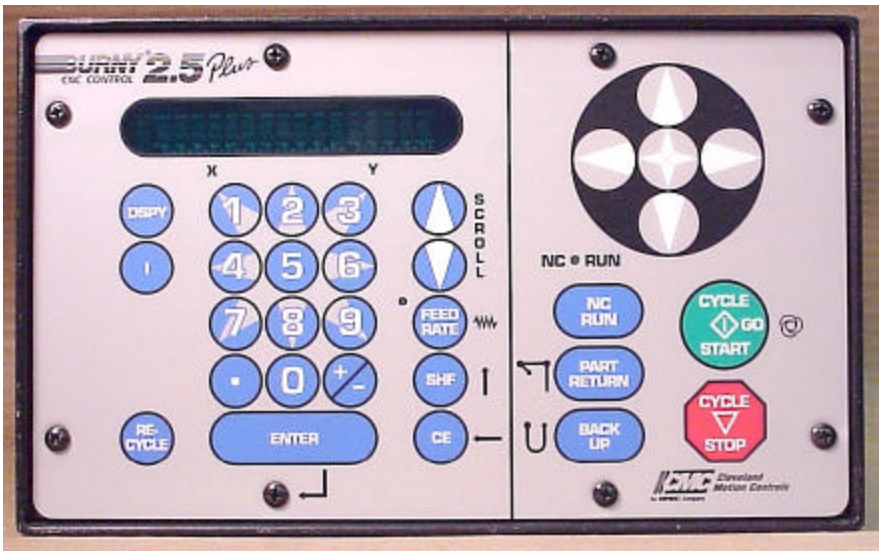


Figure 6 - Burny 2.5 *Plus* Front Panel

20. Remove the wrist strap now that the new card is installed and the cabinet is closed

21. Continue with this procedure to re-install all the data needed to make the new board function on the machine.

7. Power ON – Re-install saved data

Now that the mechanical installation of the new card is complete, the new card must be configured to run the system and act the same as the card that was removed. There will be some changes in the operation of the controls since you are updating the software to the most recent software version as a result of this card exchange. Consult the new Burny 2.5 operation manual supplied with the update kit for details on how to operate the new features.

1. Re-Apply AC power to the cutting machine and turn on the Burny system if there is a separate switch. The control should power up normally and display the familiar READY --- SELECT FUNCTION message.

2. DO NOT enable the servo drives for the system. If possible, disengage the pinion gears from the drive rack so that the machine. This is done as a precaution until it is confirmed that the parameters are working correctly in the new system.

3. Verify that the keyboard works properly. Try several operations to verify that most of the keys work correctly.

4. Press the hidden SERVICE button and select the SERV52- MEM RESET. Press ENTER and answer YES to both prompts to reset the program storage memory. After the process is done, use the DSPY80 function to display the amount of memory Used and Available. There should be almost 512K bytes available—this is the standard memory size on the MO-12438 Burny 2.5 Plus processor card.

5. Press the hidden SERVICE button and access the SERV10 parameter list. GO back to section 2.1.1 of this document and enter all the parameters in the SERV10 list. ALL PARAMETERS must be entered into the new card—do not skip any of the entries. If a value was not found in the old card, there is a suggested DEFAULT value in the table that should be entered into the new card. After the system is running, these new parameters may need to be re-adjusted to give optimal machine performance—see the new manual shipped with the update for details on the new parameter settings.

SPECIAL REQUIREMENTS FOR OLDER SYSTEMS

If the MO-12438 is being used to replace the older MO-03370, MO-4873, or MO-04875 processor cards—see APPENDIX B for information regarding the encoder scaling jumpers on these old cards, and how it affects the setup parameters

6. Refer back to Section 4 of this document where the OPTIONS from the old board were recorded. All of the features that used to be referred to as OPTIONS are now all STANDARD features in the Burny 2.5 Plus—there are no special option codes to enter. However, 2 of these old OPTION capabilities require a setting of one of the setup parameters to either ENABLE or DISABLE the feature.

COMM ENHANCE OPTION

Parameter SD51 now has a bit to control the COMM ENHANCE OPTION. This is an 8 digit parameter--for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the COMM ENHANCE option was ON with the old board, set digit D3 of the SD51 parameter to 0. (xx0xxxxx). This will cause the COMM ENHANCE to function on the new card.

- If the COMM ENHANCE option was OFF with the old board, set digit D3 of parameter SD51 to an "8" to disable the COMM ENHANCE feature on the new board— (xx8xxxxx).

KNIFE KERF OPTION

Parameter SD63 now has a bit to control the KNIFE KERF OPTION. Knife kerf is a special mode for the kerf routine that is used by the sign making industry for the special requirements of the drag knife used for cutting vinyl material, or for router cutting of plastic and aluminum for signs.

This is an 8 digit parameter-- for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the KNIFE KERF option was ON with the old board, set digit D3 of the SD63 parameter to a 1. (xx1xxxxx). This will cause the KNIFE KERF to function on the new card.

- If the KNIFE KERF option was OFF with the old board, set digit D3 of parameter SD51 to an "0" to disable the KNIFE KERF feature on the new board— (xx0xxxxx).

7. Press the hidden SERVICE button again, and access the SERV41 overlay table list. Go back to section 2.2.1 of this document and re-enter all the parameters saved from the SERV41 list in the old control.

8. Press the hidden SERVICE button again, and access the SERV42 overlay table list. Go back to section 2.3.1 of this document and re-enter all the parameters saved from the SERV42 list in the old control.

9. Press the hidden SERVICE button again, and access the SERV43 overlay table list. Go back to section 2.4.1 of this document and re-enter all the parameters saved from the SERV43 list in the old control.

10. Press the hidden SERVICE button again, and access the SERV44 overlay table list. Go back to section 2.5.1 of this document and re-enter all the parameters saved from the SERV44 list in the old control.

11. Press the hidden SERVICE button again, and access the SERV45 overlay table list. Go back to section 2.6.1 of this document and re-enter all the parameters saved from the SERV45 list in the old control.

12. Press the hidden SERVICE button and perform the SERV97 procedure to store the new parameters so they will not be lost when the power is turned off.

13. Press the hidden SERVICE button and select the SERV51-SPD CAL function—press ENTER to select the function, but DO NOT follow the prompts on the screen regarding the CYCLE START button. Instead, press the hidden SERVICE button again, and now select the SERV97 function and store the cleared speed calibration data.

14. Press the hidden SERVICE button and access the SERV78-CUSTOM AUX code conversion table. Go back to section 3.1.1 and re-enter all the data saved for the Custom AUX table from the old control. The procedure would be to press the ENTER button to get to the next AUX location, then press ENTER again to access the TVVFF entry screen. Enter the TVVFF code saved from the old control (32005) and press ENTER. You can scroll back to a previous entry to check it if desired.

15. The control should now be operational. Turn on the servo drives and test the motion of the machine. See the manual that came with this update kit for details on the new setup parameters for help in adjusting the machine's performance.

8. Appendix A – DIP Switch settings for older Burny 2.5 Front Panels

Older front panels for the Burny 2.5, as well as several of the private labeled versions did not include the 4 Directional JOG ARROWS as shown in the pictures. These panels used a sequence of pressing the II button, then used the numbered keyboard to select the jog direction.

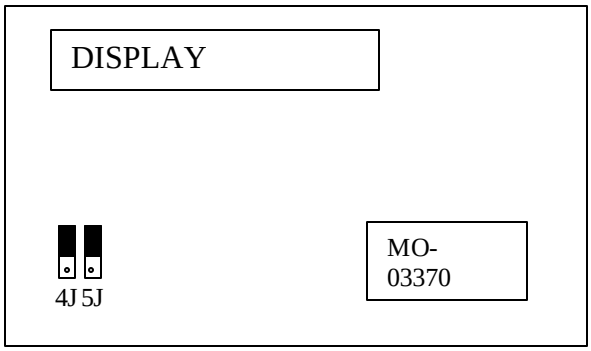
To configure the new MO-12438 board to work correctly with these older panels, the DIP switches must be set to match the configuration jumpers from the old boards.

DIP switch settings for MO-03370 processor card replacement

SW1 – ON
SW2 – OFF
SW3 – OFF
SW4 – Set to ON if Jumper 4J is set AWAY from the display.
Set to OFF if Jumper 4J is set TOWARD the display.

SW5 – Set to ON if Jumper 5J is set AWAY from the display.
Set to OFF if Jumper 5J is set TOWARD the display.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-04873 or MO-04875 processor card replacement

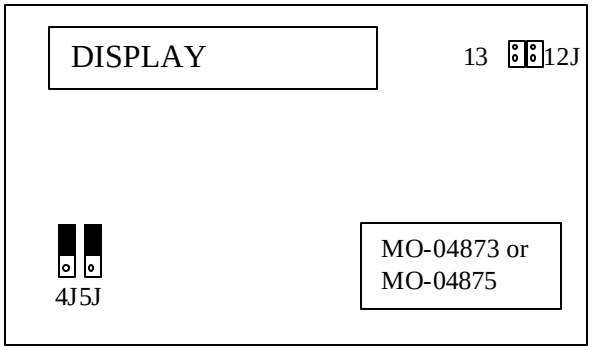
SW1 – ON
SW2 – Set to OFF if Jumper 12J is missing,
Set to ON if jumper J12 is installed

SW3 – Set to OFF if Jumper 13J is missing,
Set to ON if jumper J13 is installed

SW4 – Set to ON if Jumper 4J is set AWAY from the readout.
Set to OFF if Jumper 4J is set TOWARD the readout.

SW5 – Set to ON if Jumper 5J is set AWAY from the readout.
Set to OFF if Jumper 5J is set TOWARD the readout.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-08601 or MO-11249 processor card replacement

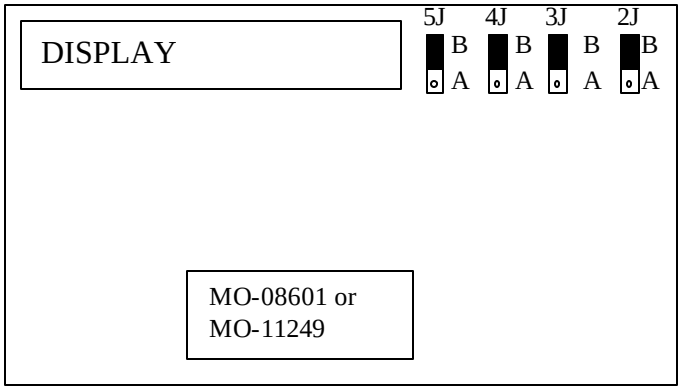
SW1 – ON
SW2– Set to OFF if Jumper J2 is set to “A”,
Set to ON if Jumper J2 is set to “B”

SW3– Set to OFF if Jumper J3 is set to “A”,
Set to ON if Jumper J3 is set to “B”

SW4– Set to OFF if Jumper J4 is set to “A”,
Set to ON if Jumper J4 is set to “B”

SW5– Set to OFF if Jumper J5 is set to “A”,
Set to ON if Jumper J5 is set to “B”

SW6, SW7, SW8 – All set to OFF



9. Appendix B – Changes to Encoder Scaling for older 2.5 updates

The older MO-03370, MO-04873 and MO-04875 processor cards included hardware jumpers J6 thru J9 on the card. These were used to tolerate faster encoder counting frequencies that could not be handled by the hardware. The newer 2.5 processor cards use faster encoder counting circuitry and eliminated these jumpers.

If one of these older boards (3370,4873,4875) are being replaced, the setting of these jumpers can affect the parameters entered into the new MO-12438 card.

If all 4 of the jumpers J6,J7,J8 and J9 are set toward the display (See Fig. 1), then the setup parameters from the old board can be directly entered into the new card.

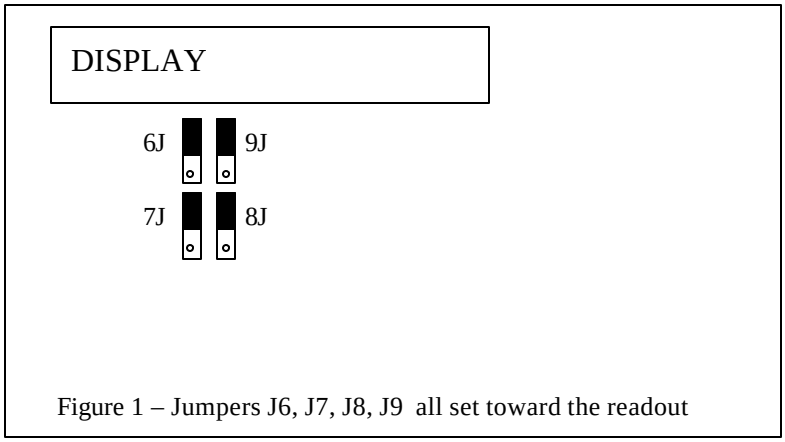


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

Some installations may be using faster encoders, particularly motor mounted encoders, and may have these jumpers set the opposite direction. If all 4 of the jumpers J6,J7, J8, J9 (Figure 2) are set away from the DISPLAY, then the value recorded for parameter SD22- ENC LINES/REV must be multiplied by 4. So for example, a system where the old card had a setting of 500 for SD22 would need to have 2000 entered into the new MO-12438 to work properly.

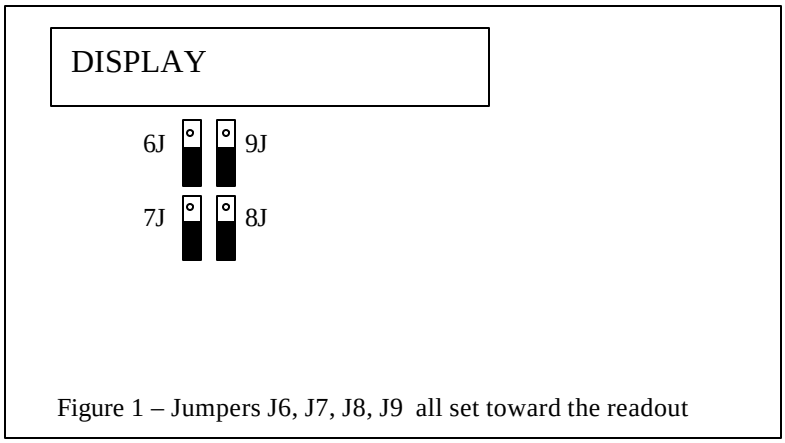


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

If the old system has jumpers J6, J7, J8, J9 set to any other random pattern, contact the factory since this will require modifying several of the system parameters. This is very uncommon.

10. Appendix C "Burny 2.5 Plus-- New features and Capabilities"

The goal of the 2.5 Plus development program was to produce a new version of the computer board in the Burny 2.5 series products that would improve the speed and system performance, without affecting the basic operation. The 2.5 Plus processor card will perform RS-232 downloads, and the Kerf calculations 80-90% faster than the older cards.

Most of the prompting, displays and operator inputs are exactly the same as the older cards—so there is little or no re-training required when the new 2.5 Plus card is substituted for an older card. However, there is the problem that the 2.5 Plus basically copies the operation of the Burny 2.5 software that was in existence at the end of 1999. If the older 2.5 card had software dating back many years (could go back as far as 1988), then there will be substantial differences in the machine's operation due to the changes and improvements that have occurred over the years of software development on the Burny 2.5 product line. This may require some additional training for the operators to become familiar with the new operation of the control, and the new capabilities available to the operator. See the new OPERATION MANUAL supplied along with this Burny 2.5 Plus product for details on all the current features of the product.

The two main areas where a difference will be noted are in the Serial I/O downloading speeds, and the Kerf processing speed.

Kerf Processing speed

The Kerf process is self contained within the Burny 2.5 Plus—there is no interaction with the outside world so the process can function at peak efficiency.

Serial I/O Downloading Speed

The Serial I/O downloading is a different matter. Since the Serial I/O communication via the RS-232/422 port connects to devices outside the Burny product, the performance of the downloading system is very dependent on the performance and setting of the external devices. For example, if the existing cutting machine had the BAUD rate set to 2400 Baud for the serial downloading speed, there will be NO increase in performance of the Serial Downloading speed with the Burny 2.5 Plus—the older card work just as well at 2400 baud as the new 2.5 Plus card. To fully take advantage of the new downloading speed capacity of the Burny 2.5 Plus card, the external system must be capable of supplying the data faster also. The following is an ESTIMATE of the speed improvement expected for various Baud rate settings of the Burny 2.5 Plus. Note that the higher baud rate settings were not even possible with the older Burny 2.5 which was normally used up to about 4800 baud.

Serial I/O Downloading Baud Rate setting	ESTIMATED speed improvement with Burny 2.5 Plus.
300 to 2400 Baud	0%-- Same speed as older card
4800 Baud	25% Less time for download
9600 Baud	60% Less time for download
19.2K Baud	80% Less time for download
28.8K Baud	80% Less time for download
38.4K Baud	75% Less time for download
57.6K to 230K Baud	60-75% Less time—note that these very high baud rates require more system overhead and are actually LESS EFFICIENT than the somewhat slower settings from 19.2K to 38.4K Baud

Serial Number and Option codes

The Burny 2.5 Plus software does not use Option codes—all possible features for the product are available as Standard capabilities with every system that ships. Similarly, there is no longer a SERIAL NUMBER imbedded into the product—the display will show " SERIAL 0" for all Burny 2.5 Plus products. The main purpose for the Serial number was to control the software lockout codes for the options—no more options means no more serial number.

The fact that all Options are now standard will cause some new menus and displays to show up on older controls where a particular option was missing before. For example, if an older Burny 2.8 did not have the STANDARD SHAPES option installed, there would not have been a menu choice for "LOAD-STANDARD SHAPE" in the select function list. When the 2.5 Plus card is installed, the operator will now see this "LOAD- STANDARD SHAPE" prompt – this should be explained to the operator ahead of time to avoid possible confusion.

The following is a list of the features that will now appear on all controls—the ones marked ** may have been missing from the older card—they are now provided as a standard capability of the new Burny 2.5 Plus software:

- RUN- PROGRAM
- LOAD- FROM STD SHAPE ** (Older card required Standard Shape option to be enabled)
- LOAD- FROM RS-232 ** (Older card required Serial I/O Option to be enabled)
- STORE- TO RS-232 ** (Older card required Serial I/O Option to be enabled)
- TEACH- PROGRAM ** (Older card required Teach Option to be enabled)
- DELETE-PROGRAM
- EDIT-PROGRAM ** (Very old cards could only access EDIT via DSPY20-)
- LOAD- FROM FLOPPY ** (Older cards required Floppy option to be enabled)
- STORE- TO FLOPPY ** (Older cards required Floppy option to be enabled)
- LOAD/RUN- RS-232 ** (Older cards required Serial I/O option to be enabled)
- LOAD/RUN-FLOPPY ** (Older cards required Floppy option to be enabled)

Some operators may complain that they have to Scroll through too many choices in this new expanded list of features to get what they want. Remember that these choices can be made with a single button push as described in the operation manual— as a reminder, the following number keys select the indicted function:

- RUN- PROGRAM -- Press the number 1 on the keypad
- LOAD- FROM STD SHAPE -- Press the number 2 on the keypad
- LOAD- FROM RS-232 -- Press the number 3 on the keypad
- STORE- TO RS-232 -- Press the number 4 on the keypad
- TEACH- PROGRAM -- Press the number 5 on the keypad
- DELETE-PROGRAM -- Press the number 6 on the keypad
- EDIT-PROGRAM -- Press the number 7 on the keypad
- LOAD- FROM FLOPPY -- Press the number +/- on the keypad
- STORE- TO FLOPPY -- Press the number . (decimal point) on the keypad
- LOAD/RUN- RS-232 -- Press the number 3, then the SHF on the keypad
- LOAD/RUN-FLOPPY -- Press the +/- key, then the SHF on the keypad

Blank

Burny 2.5 PLUS Update

Installation instructions for field upgrades using the Burny 2.5 PLUS processor card.

Also for use with MO-12685 and MO-12742 upgrade kits

ECO REVISION HISTORY

Revision	*Description*	*ECO*	*Date*
-AA	Written	---	28-July-00
-BA	Add photos, DIP Switch and parameter for old cards	CLE1716	07-Dec-00

Spec No.:	*Division:* BURNY
Author: RDM	*Rev:* **BA**
File name: AO-90177BA.doc	*Date:* **7-Dec-2000**

Cleveland Motion Controls
An IMC Company

REVISION HISTORY

Rev AA	RDM (28-July-2000) -- Written
Rev BA	JRB (7-Dec-2000) -- Added retrofit Figures and references
	RDM(7-Dec-2000) -- Add APPENDIX A,B for Dip switch settings for older front panels, and APPENDIX B for modifications needed to Encoder Scaling parameters when MO-3370 or 4873 or 4875 board was replaced.

TABLE OF CONTENTS

1. INTRODUCTION

These instructions document the steps needed to update existing Burny 2.5 controls, or any of the other Series 2 controls (1250,1400, 2.8, 2.9) with the new MO-12438 Burny 2.5 Plus processor card. The procedure assumes the installer is familiar with the Burny products and is capable of the mechanical assembly/disassembly and entry of parameters into the system.

For updates on a Burny 1250 or Burny 1400 system, the original keyboard can still be used—just the processor card is replaced as described in the following procedures.

For Burny 2.5, Burny 2.8 or Burny 2.9 systems, a special part number MO-12685 has been created to provide a new processor card with the new 2.5 Plus keyboard. This is necessary since the older Burny 2.5 keyboards do not have the proper clearance in the aluminum panel for the current readout used on the Burny 2.5 products. By ordering this MO-12685 kit, the installer is assured of having a panel that works fits the readout.

The main purpose of this particular procedure is to document all of the stored parameters, option codes, Aux code conversion tables, etc. which are configured in the existing Series 2 control BEFORE the new processor card is installed. Once the new card is operational, this stored data from the old system will be re-entered with the goal of making the new card capable of running the machine in as little time as possible.

2. PARAMETER and SYSTEM DATA RETRIEVAL

Before disassembling anything, the installer must first retrieve all the data stored in the existing Burny 2.5 system. There is no automatic way to do this with the older software, therefore the data must be manually obtained. The following pages have procedures and tables to be used to write down the parameter data, Code Conversion table data, and options enabled in the current system. Then, after the new processor card and panel are installed, these values must be manually re-entered into the new system. If this process is done correctly, and attention is paid to getting the data correct, the new system should begin operation with no further tuning required.

2.1 System Data Parameters-SERV10

With the existing system operating normally, press the hidden "SERVICE" button and access SERV10-SYS DATA. Press ENTER to display the main system parameter list. The display shows the first parameter as:

SD01-ARC ON DELAY

Press the ENTER button a second time to display the value currently set for this parameter—if the Arc On delay had been set for 3 seconds, the display would now show:

AONDLY = 3.00

Write down this 3.00 value in the following table. Press the ENTER button to access the next parameter name, and then press the ENTER button a second time to access the value—the display would have showed:

SD02-BLEEDOFF then BLEDOF= 2.00 (2 seconds used for this example)

Continue stepping through the entire list of parameters and write their values in the able provided.

IMPORTANT: Older systems may not include all the parameters shown on this list.

Older systems had less parameters than the current Burny 2.5—therefore it is important to carefully pay attention to the parameter number displayed on the screen, and match it to the table before writing the value. Any parameters that were not included in the old system will be handled during the installation portion for the new card.

2.1.1 SERV10 PARAMETERS

Parameter Number and Name	PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN	Default value to be used for older systems where a parameter was not part of the older products list.	Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system
SD01- ARC ON TIME	ARCDLY =		
SD02- BLEEDOFF	BLEDOF =		
SD03- ACCEL TIME	ACCTME =		
SD04- MAX DRV SPD	MAXSPD =		
SD06- BACKUP SPD	BCKSPD =		
SD07- CORNER SPD	CORSPD =		
SD08- MIN HLD SPD	MINHLD =		
SD09- ERR SPD MAX	ERRSPD =	20 inch/min 400 mm/min	

SD10- RUNSPD LIMIT	RUNLMT =		
SD11- TRAVERS LMT	TRVLMT =		
SD12- MIN ACCEL	MIN ACCEL =	.20 seconds	
SD14- GAIN BREAK	GAIN BREAK =	0	
SD15- ERR WRN DST	WRNDST =		
SD16- LOOP GAIN	LPGAIN =		
SD17- ARC OFF DLY	AOFDLY =	2.0 seconds	
SD18- SLWDWN DIST	SLWDST =		
SD19- DISABL DIST	DISABL =	.25 inches 6.3 mm	
SD20- X ENC DIST	XENSCL =		
SD21- Y ENC DIST	YENSCL =		
SD22- ENC LIN/REV	ENC LINES =		
SD23- X ENC DIR	X ENC DIR -		
SD24- Y ENC DIR	Y ENC DIR -		
SD25- X DRV DIR	X DRV DIR -		
SD26- Y DRV DIR	Y DRV DIR -		
SD27- PLATE SIDE	PLATE ON -		
SD28- HEIGHT RLY	CONTACT -		
SD29- SLWDWN RAD	SLWRAD =		
SD30- MIN RAD SPD	MRADSP =	30 inches/min 150 mm/min	
SD31- PLASMA TB1	PLASMA TB1 =	NO	
SD32- MIN SLW ANG	MINSLW =	10	
SD33- MAX SLW ANG	MAXSLW =	22	
SD40- X MARK OFF	XOFST1 =		
SD41- Y MARK OFF	YOFST1 =		
SD42- MARKER SPD	MRKSPD =		
SD43- MARK DELAY	MRKDLY =		
SD45- DEFLT DWELL	DFDWEL =		
SD46- MIN OFF DWL	MINOFF =		
SD47- XOFST2	XOFST2 =		

SD48- YOFST2	YOFST2=		
SD49- START DELAY	STRDLY =	1.5 seconds	
SD50- SERIAL DEFN	SERIAL DEFN =		
SD5- PRGM FORMAT	PGMFMT =		
SD52- SPECIAL EOP	EOP 1 =		
SD53- FILE EXTEN	FEXTEN =	434E4300	
SD60- OPER SYS	OPER SYS =		
SD61- SYS CONFG 1	SYSCFG1 =		
SD62- SYS CONFG 2	SYSCFG2 =		
SD63- SYS CONFG 3	SYSCFG3 =	0	
SD65- OVERLAY CFG	OVERLAY CFG =	0	
SD68- SPEED RANGE	SPEED RANGE =	4	
SD69- LA NGUAGE	LANGUAGE =	0	
SD70- KNF ROT DIA	KNFDIA =		
SD71- KNF B.P. ANG	KNF B.P. ANG =		
SD74- T2XHOM	T2XHOM =		
SD75-T2YHOM	T2YHOM =		
SD76- T3XHOM	T3XHOM =		
SD77- T3YHOM	T3YHOM =		
SD78- T4XHOM	T4XHOM =		
SD79- T4YHOM	T4YHOM =		
SD80- XOFST1	XOFST1 =		
SD81- XOFST1	YOFST1 =		
SD82- XOFST2	XOFST2 =		
SD83- XOFST2	YOFST2 =		
SD84- XOFST3	XOFST3 =		
SD85- XOFST3	YOFST3 =		
SD86- XOFST4	XOFST4 =		
SD87- XOFST4	YOFST4 =		
SD88- XOFST5	XOFST5 =		

SD89- XOFST5	YOFST5 =		
SD90- XOFST6	XOFST6 =		
SD91- XOFST6	YOFST6 =		
SD92- XOFST7	XOFST7 =		
SD93- XOFST7	YOFST7 =		
SD94- XOFST8	XOFST8 =		
SD95- XOFST8	YOFST8 =		
SD96- XHOMSW	XHOMSW =		
SD97- XHOMSW	YHOMSW =		
SDA0- XBKLSH	XBKLSH =	0	
SDA1- YBKLSH	YBKLSH =	0	
SDA2- LSH RATE	LSH RATE =		
SDD0- SYNC W-AXIS	SYNC ENABLE =	NO	
SDD1- W GAIN	W GAIN =		
SDD2- SKEW LIMT	SKWLMT =		
SDD3- W MAX SPD	WMXSPD =		
SDD4- W ENC DIR	W ENCODER =		
SDD5- W DRV DIR	W DRIVE =		
SDD6- WBKLSH	WBKLSH =		
SDD7 – W OFFSET	WOFSET =		

2.2 System Overlay Table #1 Parameters - SERV41

Burny 2.5 systems built after 1983 had the 5 sets of additional setup parameters which could be selected by programming codes within a part program to "overlay" the standard SERV10 parameter list. Access this list of values by pressing the hidden "SERVICE" button and access SERV41-TB 1 DATA. Press ENTER to display the overlay table #1 list. Note this list is much shorter than the SERV10 list. Again, carefully step down through the list and write the values in the following list:

2.2.1 SERV41 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
1-03- ACCEL TIME	ACCTME =		
1-07- CORNER SPD	CORSPD =		
1-10- RUNSPD LIMIT	RUNLMT =		
1-12- MIN ACCEL	MIN ACCEL =		
1-14- GAIN BREAK	GAIN BREAK =		
1-16- LOOP GAIN	LPGAIN =		
1-18- SLWDWN DIST	SLWDST =		
1-19- DISABL DIST	DISABL =		
1-29- SLWDWN RAD	SLWRAD =		
1-30- MIN RAD SPD	MRADSP =		
1-32- MIN SLW ANG	MINSLW =		
1-33- MAX SLW ANG	MAXSLW =		
1-45- DEFLT DWELL	DFDWEL =		
1-46- MIN OFF DWL	MINOFF =		
1-49- START DELAY	STRDLY =		

2.3 System Overlay Table #2 Parameters - SERV42

Continue with this process to access the data in Overlay Table #2 by pressing the hidden "SERVICE" button and access SERV42-TB 2 DATA. Press ENTER to display the overlay table #2 list.

2.3.1 SERV42 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
2-03- ACCEL TIME	ACCTME =		
2-07- CORNER SPD	CORSPD =		
2-10- RUNSPD LIMIT	RUNLMT =		
2-12- MIN ACCEL	MIN ACCEL =		
2-14- GAIN BREAK	GAIN BREAK =		
2-16- LOOP GAIN	LPGAIN =		
2-18- SLWDWN DIST	SLWDST =		
2-19- DISABL DIST	DISABL =		
2-29- SLWDWN RAD	SLWRAD =		
2-30- MIN RAD SPD	MRADSP =		
2-32- MIN SLW ANG	MINSLW =		
2-33- MAX SLW ANG	MAXSLW =		
2-45- DEFLT DWELL	DFDWEL =		
2-46- MIN OFF DWL	MINOFF =		
2-49- START DELAY	STRDLY =		

2.4 System Overlay Table #3 Parameters - SERV43

Continue with this process to access the data in Overlay Table #3 by pressing the hidden "SERVICE" button and access SERV43-TB 3 DATA. Press ENTER to display the overlay table #3 list.

2.4.1 SERV43 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
3-03- ACCEL TIME	ACCTME =		
3-07- CORNER SPD	CORSPD =		
3-10- RUNSPD LIMIT	RUNLMT =		
3-12- MIN ACCEL	MIN ACCEL =		
3-14- GAIN BREAK	GAIN BREAK =		
3-16- LOOP GAIN	LPGAIN =		
3-18- SLWDWN DIST	SLWDST =		
3-19- DISABL DIST	DISABL =		
3-29- SLWDWN RAD	SLWRAD =		
3-30- MIN RAD SPD	MRADSP =		
3-32- MIN SLW ANG	MINSLW =		
3-33- MAX SLW ANG	MAXSLW =		
3-45- DEFLT DWELL	DFDWEL =		
3-46- MIN OFF DWL	MINOFF =		
3-49- START DELAY	STRDLY =		

2.5 System Overlay Table #4 Parameters - SERV44

Continue with this process to access the data in Overlay Table #4 by pressing the hidden "SERVICE" button and access SERV44-TB 4 DATA. Press ENTER to display the overlay table #4 list.

2.5.1 SERV44 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
4-03- ACCEL TIME	ACCTME =		
4-07- CORNER SPD	CORSPD =		
4-10- RUNSPD LIMIT	RUNLMT =		
4-12- MIN ACCEL	MIN ACCEL =		
4-14- GAIN BREAK	GAIN BREAK =		
4-16- LOOP GAIN	LPGAIN =		
4-18- SLWDWN DIST	SLWDST =		
4-19- DISABL DIST	DISABL =		
4-29- SLWDWN RAD	SLWRAD =		
4-30- MIN RAD SPD	MRADSP =		
4-32- MIN SLW ANG	MINSLW =		
4-33- MAX SLW ANG	MAXSLW =		
4-45- DEFLT DWELL	DFDWEL =		
4-46- MIN OFF DWL	MINOFF =		
4-49- START DELAY	STRDLY =		

2.6 System Overlay Table #5 Parameters - SERV45

Continue with this process to access the data in Overlay Table #5 by pressing the hidden "SERVICE" button and access SERV45-TB 5 DATA. Press ENTER to display the overlay table #5 list.

2.6.1 SERV54 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
5-03- ACCEL TIME	ACCTME =		
5-07- CORNER SPD	CORSPD =		
5-10- RUNSPD LIMIT	RUNLMT =		
5-12- MIN ACCEL	MIN ACCEL =		
5-14- GAIN BREAK	GAIN BREAK =		
5-16- LOOP GAIN	LPGAIN =		
5-18- SLWDWN DIST	SLWDST =		
5-19- DISABL DIST	DISABL =		
5-29- SLWDWN RAD	SLWRAD =		
5-30- MIN RAD SPD	MRADSP =		
5-32- MIN SLW ANG	MINSLW =		
5-33- MAX SLW ANG	MAXSLW =		
5-45- DEFLT DWELL	DFDWEL =		
5-46- MIN OFF DWL	MINOFF =		
5-49- START DELAY	STRDLY =		

3. Retrieving Custom Aux Table Data – SERV78

The Burny 2.5 has the ability to convert the M and G or ESSI auxiliary functions in a part program into the functional codes needed by the Burny to cut the part. The data for making this conversion is contained in a list accessed by pressing the hidden "SERVICE" button, and then selecting the SERV78-CUSTOM AUX utility. Press ENTER to access the first entry in the list. There are 2 display formats used with this list—when the table is first accessed, the display will be in the "Table position" mode which shows which of the 50 possible entries is being displayed, and the current setting for that table location:

AUX01-M20-CUTOFF

This indicates that the first table location "AUX01" contains the data to convert an M20 code from a word address program into an internal Cut Off function—turn the oxygen or plasma off at the end of a cut.

Pressing ENTER at this point changes the display to show the TVVFF code for the AUX01 entry—the display will appear as:

32005-M20-CUTOFF

The 32005 is the TVVFF code:

T -- a single digit that defines the type of code begin converted (1-ESSI, 2-G code, 3-M code)

VV – a 2 or 3 digit value (up to 127) that defines the numeric value for the code (20 in this example)

FF – a 2 digit code defining the internal function assigned to the code (see Burny 2.5 manual for the list)

It is NOT necessary to understand what all these codes do to install the Burny 2.5 Plus processor card--- the important thing is to get them written down in the following chart so they can be re-entered in the new control.

The procedure would be to step through the list for each of the AUX entries and write down the data displayed for the block and the TVVFF displays.

While this list contains a maximum of 50 entries, the number of AUX table entries is usually much less. The end of the list is indicated by a display of a location being AVAILABLE. This means that no data has been entered for this table entry—the Burny will not search the table past this AVAILABLE location therefore any data following the first AVAILABLE location is not needed—it would not affect the controls operation in any way.

Begin stepping through the list and write down the data in the following chart:

3.1.1 AUX CODE TABLE DATA

Table location display: Example: AUX01 – M20 – CUT OFF	TVVFF display Example:32005 – M20 – CUT OFF
AUX01 -- --	-- --
AUX02 -- --	-- --
AUX03 -- --	-- --

AUX04	--	--	--	--
AUX05	--	--	--	--
AUX06	--	--	--	--
AUX07	--	--	--	--
AUX08	--	--	--	--
AUX09	--	--	--	--
AUX10	--	--	--	--
AUX11	--	--	--	--
AUX12	--	--	--	--
AUX13	--	--	--	--
AUX14	--	--	--	--
AUX15	--	--	--	--
AUX16	--	--	--	--
AUX17	--	--	--	--
AUX18	--	--		
AUX19	--	--		
AUX20	--	--		
AUX21	--	--		
AUX22	--	--		
AUX23	--	--		
AUX24	--	--		
AUX25	--	--		
AUX26	--	--		
AUX27	--	--		
AUX28	--	--		
AUX29	--	--		
AUX30	--	--		
AUX31	--	--		
AUX32	--	--	--	--
AUX33	--	--	--	--
AUX34	--	--	--	--
AUX35	--	--	--	--
AUX36	--	--	--	--

AUX37	--	--	--	--	
AUX38	--	--			
AUX39	--	--			
AUX40	--	--			
AUX41	--	--			
AUX42	--	--			
AUX43	--	--			
AUX44	--	--			
AUX45	--	--			
AUX46	--	--			
AUX47	--	--			
AUX48	--	--			
AUX49	--	--			
AUX50	--	--			

4. OPTION CODES

All of the Burny 2.5 and related Series 2 controls have various software options that are enabled by special "Lockout" codes based on the serial number of the control. While the new Burny 2.5 Plus card has all "options" now loaded as standard features, the Option Settings for the old board must be documented to determine some of the parameter settings on the new board.

There are two ways that this is done, depending on the age of the software in the existing control.

4.1 Option code display on very old systems.

Very old systems only display the options as a coded text string during power-up. The control will turn on and go through it's normal tests, and then display a text string as:

OPTN- C2D4007000

Each digit in this display references a particular option.

Turn the power Off, and back On to the control, and wait for this string to appear—then record the value in the following spaces (it may take several cycles of power Off/On to get the entire string written down correctly).

OPTN										

4.2 Option code display on newer Burny 2.5 (Series 2) systems

Controls with more recent software will have a display function called DSPY80 which tells the ON/OFF status of each option directly on the screen. Press the DSPY button and select DSPY80. When the ENTER button is pressed, the display will first show a sequence of values showing the serial number, hardware type and how much memory is used. Press the ENTER button during this sequence and the display will change to show:

OPTIONS

KERF --- ON or KERF --- OFF

Pressing enter will step down through this list and show the status of each option as ON or OFF. Record these values in the following chart for later use. Some of these options may not appear in the list since they are now considered "standard"—the chart has locations for them to make the recording process easier

4.2.1 Option ON/OFF status

OPTION NAME	ON/OFF
KERF	
SCALE	
ROTATE	
MIRROR	
PLATE ALIGN	
SERIAL COMM	
COMM ENHANCE	
CAD LINK	
PLATE MARKER	
STD. SHAPES	
TEACH	
KNIFE KERF	
CUSTOM AUX.	
LANGUAGE or individual language such as SPANISH, FRENCH, GERMAN, etc.	
FLOPPY DRIVE	
PRG. FDRT/KRF (programmable feedrate and kerf)	

5. BACKUP PART PROGRAMS

The final section of data that must be transferred from the existing Burny 2.5 to the new Burny 2.5 PLUS card are the stored part programs in the control. Part programs could have been created by either loading a Standard Shape, Template Teach, Downloading a program from the serial port or a Floppy, or creating a program using the Editor.

When the old processor card is removed from the system, these programs will be lost unless they are backed up to some external device. Some customers will already have all of their programs stored on the host computer, so there is no need to backup the data from the Burny 2.5. However, other customers will have programs created by template teach, that are only stored in the Burny 2.5's memory—these programs should be backed up if possible.

This can be done in two ways.

If the system is equipped with a serial port, and the external computing device can accept program uploads, use the STORE function in the Burny 2.5 to store to the RS-232 port and send all the internal programs up to the host computer.

If the system is equipped with an internal or external Floppy Disk drive, use the STORE function in the Burny 2.5 and store the programs to a series of floppy disks so they can be reloaded into the new card.

6. Power Off—Swap processor cards

Now that all the data from the existing Burny 2.5 processor card has either been stored to some external device, or recorded on this document on the lists provided, the old card can be removed, and the new card installed.

IMPORTANT: Remove all sources of AC power to the machine before performing any service work. The main power disconnect should be turned off and Locked in the OFF state to prevent someone from accidentally turning the power back on during the service operation.

WARNING: Proper handling procedures must be followed when installing the new MO-12438 Burny 2.5PLUS processor card. This card contains many high speed, high density electronic devices that can be damaged by STATIC ELECTRICITY caused by improper handling. Before removing the card from it's protective bag, the installing technician MUST use a grounded anti-static wrist strap connected to the machine chassis. All sources of STATIC ELECTRICITY should be removed from the area (any styrofoam, plastic packing material, bubble wrap, plastic paper sleeve protectors, etc). Once the board is removed from it's protective bag, it should be installed directly into the Burny system—do not lay it on a table or other surface that may not be grounded.

**The existing Burny 2.5 processor card should be placed back into the same protective anti-static bag after it is removed from the system. **

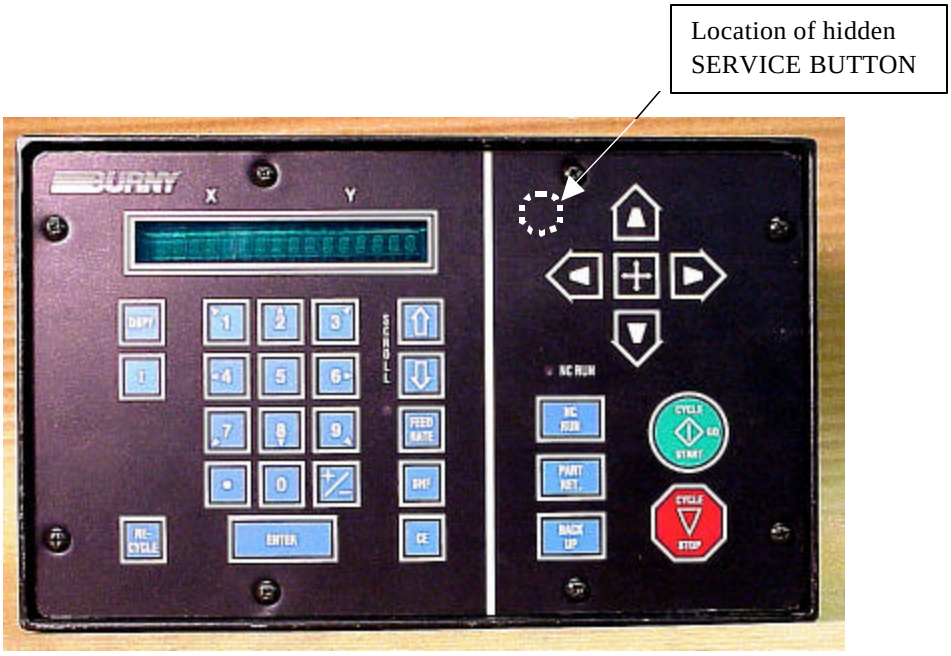


Figure 1- Typical Burny 2.5 Front Panel

Card installation:

1. Remove all sources of AC power to the machine, and lock-out the power disconnect to the machine to prevent accidental re-application of AC power during the service process.

2. Connect a grounded anti-static wrist strap to the machine frame and place it on the wrist of the installing technician.

3. Remove the screws holding the front panel of the product. For the Burny 2.5, these are the 8 screws around the keyboard panel. On the 1250 and 1400, there are 8 to 10 screws holding in the entire front hinged door. And finally, on the Burny 2.8, there are 22 screws holding the entire top cover of the cabinet—remove all but the bottom 4 screws along the lower front edge of the cabinet—just loosen the front 4 screws and lift the lid out of the slotted holes. See Figure 1.

4. Once the screws are removed, lay the front panel open so the screws holding the interface card to the processor card can be accessed.

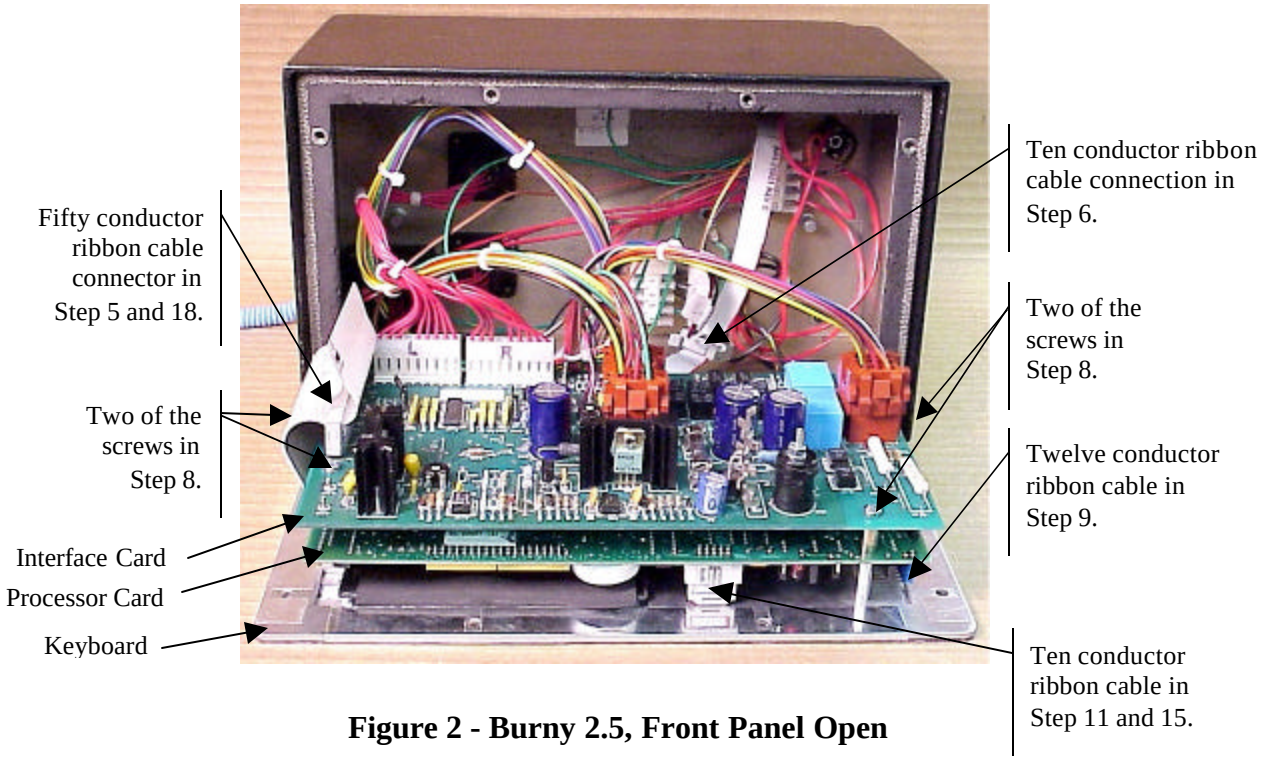


Figure 2 - Burny 2.5, Front Panel Open

5. Unplug the large 50 conductor ribbon cable that runs from the processor card to the interface card. See Figure 2.

6. Disconnect the 10 conductor ribbon cable from the processor card to the RS-232/422 modem. See Figure 2.

7. If installed, unplug the 14 conductor ribbon cable that runs from the processor card to the optional home limit switch input card used on some Burny 2.5 and 2.8 systems. See Figure 3.

8. Remove the 4 screws holding the interface card to the processor card in the system. This will make the interface and the processor card free floating so take care not to drop or stress the wires in the system during

this step. See Figure 2.

9. Lift the processor card slightly away from the keyboard panel, and unplug the 12 conductor ribbon that runs from the keyboard panel to the processor. See Figure 2.

10. Remove the old processor card from the system.

11. Remove the short 10 and/or 14 conductor ribbon cables from the old processor card—these will be re-used with the new card. See Figure 3.

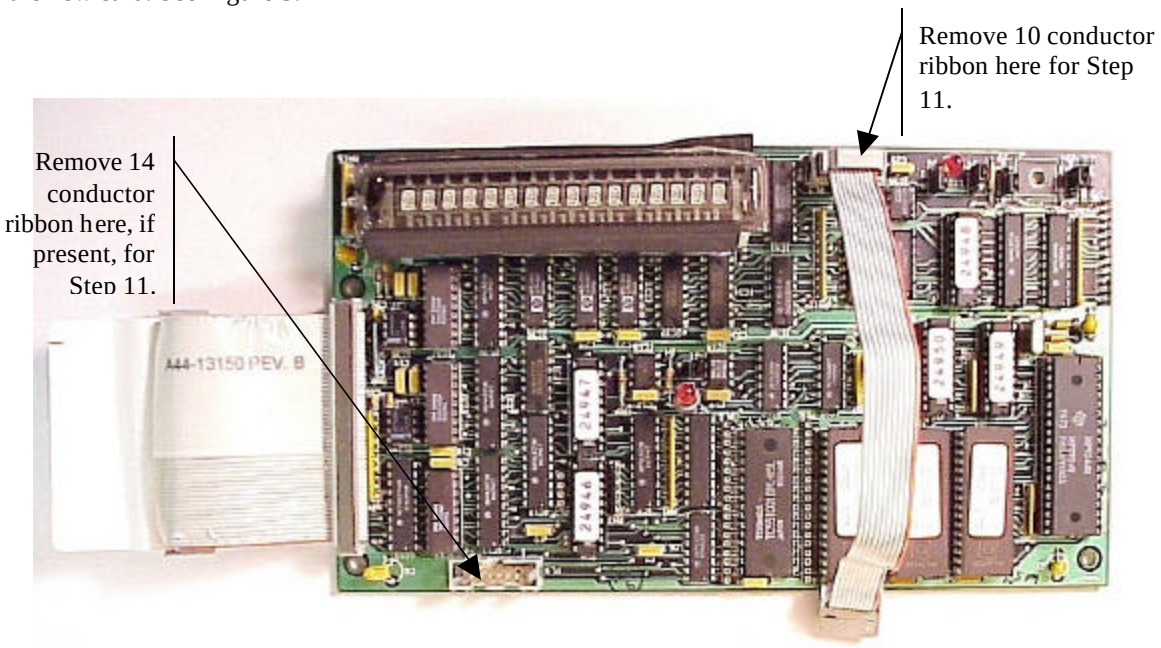


Figure 3 - Burny 2.5 Existing Processor Board

12. If a Burny 2.8 is being updated, remove the old keyboard by removing the 6 screws around the bezel on the front of the unit and discarding the old keyboard. Install the new keyboard supplied with the updated kit using the same screws and bezel as the old panel.

13. If a Burny 2.5 is being updated, discard the old keyboard. Use the new keyboard supplied with the update kit.

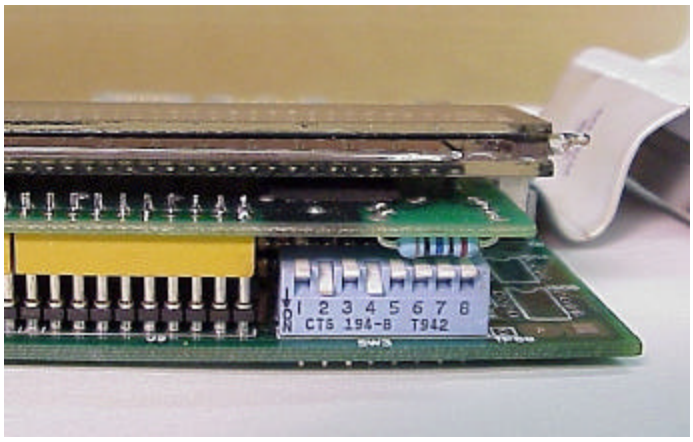


Figure 4 - DIP Switch in Step 14

14. Remove the new MO-12438 processor card from it's protective bag. See Figure 5 and 9. Set the DIP switch located on the new card under the readout as follows:

    - When using the MO-12438 card with any of the Burny 2.5 type keyboards that include the **4 DIRECTIONAL JOG ARROWS,** or with a **Burny 1250** or **Burny 1400** keyboard which also include the jog arrow buttons, the DIP switch on the MO-12438 **MUST** be set as follows:

      Position 1 -- OFF
      Position 2 -- ON
      Position 3 -- OFF
      Position 4 -- ON
      Position 5 -- OFF
      Position 6 -- OFF
      Position 7 -- OFF
      Position 8 -- OFF

      See Figure 4 -- these are the proper jumper settings when used with the new Burny 2.5 Plus front panel.

    - See APPENDIX A for details and precautions for using the MO-12438 card with older style Burny 2.5, 2.8 and private label keyboard panels.

15. Re-connect the 10 and/or 14 conductor ribbon cables to the new processor card—the connectors for these cables are located in almost the exact same location as the old card. Take care that the 10 pin cable for the serial RS-232/422 port is connected to the J4 connector on the new card. There is another 10 pin connector on the new processor card that will be used for software updates—but it will not function for the RS-232 port use. See Figure 5.

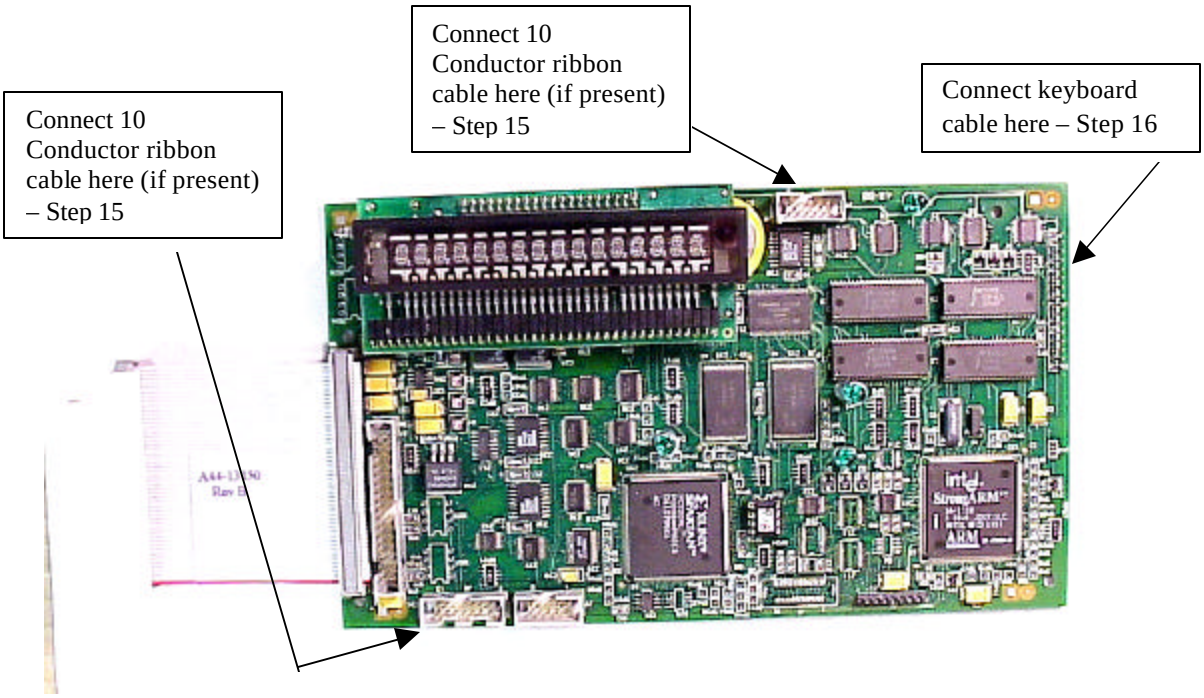


Figure 5 - Front of New Processor Board

16. Place the new MO-12438 card over the keyboard, and connect the ribbon from the keyboard to the J1 connector on the new processor card. Be sure to apply the ribbon connector starting at pin 1 of the J1 connector—the new processor card has some extra pins included in the J1 connector for future expansion—the older keyboards must be connected to the original 12 input pins. Also make sure the 10 or 14 conductor additional ribbon cables are routed under the card properly and are not pinched or interfering with the LED's or other devices.

17. Align the interface card and new processor over the keyboard standoffs, and replace the 4 screws to hold these two boards together.

18. Connect the 10, 14 and 50 conductor ribbon cables to their respective locations in the system. See Figure 2.

19. Replace the keyboard in the cabinet on 2.5 systems, close the door on the 1250/1400 or replace the 2.8's cabinet lid and replace the screws to hold in the panel or door. Make sure all screws are tight to insure a dust tight seal around the opening.

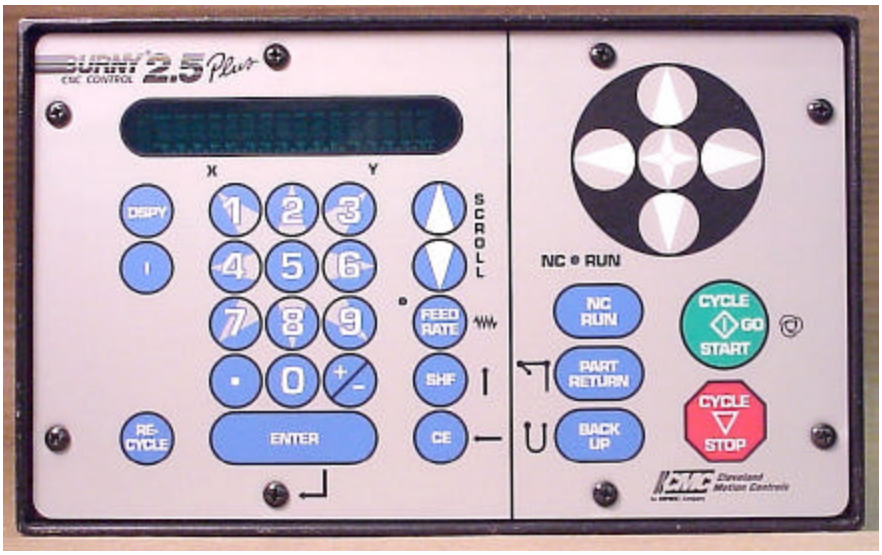


Figure 6 - Burny 2.5 *Plus* Front Panel

20. Remove the wrist strap now that the new card is installed and the cabinet is closed

21. Continue with this procedure to re-install all the data needed to make the new board function on the machine.

7. Power ON – Re-install saved data

Now that the mechanical installation of the new card is complete, the new card must be configured to run the system and act the same as the card that was removed. There will be some changes in the operation of the controls since you are updating the software to the most recent software version as a result of this card exchange. Consult the new Burny 2.5 operation manual supplied with the update kit for details on how to operate the new features.

1. Re-Apply AC power to the cutting machine and turn on the Burny system if there is a separate switch. The control should power up normally and display the familiar READY --- SELECT FUNCTION message.

2. DO NOT enable the servo drives for the system. If possible, disengage the pinion gears from the drive rack so that the machine. This is done as a precaution until it is confirmed that the parameters are working correctly in the new system.

3. Verify that the keyboard works properly. Try several operations to verify that most of the keys work correctly.

4. Press the hidden SERVICE button and select the SERV52- MEM RESET. Press ENTER and answer YES to both prompts to reset the program storage memory. After the process is done, use the DSPY80 function to display the amount of memory Used and Available. There should be almost 512K bytes available—this is the standard memory size on the MO-12438 Burny 2.5 Plus processor card.

5. Press the hidden SERVICE button and access the SERV10 parameter list. GO back to section 2.1.1 of this document and enter all the parameters in the SERV10 list. ALL PARAMETERS must be entered into the new card—do not skip any of the entries. If a value was not found in the old card, there is a suggested DEFAULT value in the table that should be entered into the new card. After the system is running, these new parameters may need to be re-adjusted to give optimal machine performance—see the new manual shipped with the update for details on the new parameter settings.

SPECIAL REQUIREMENTS FOR OLDER SYSTEMS

If the MO-12438 is being used to replace the older MO-03370, MO-4873, or MO-04875 processor cards—see APPENDIX B for information regarding the encoder scaling jumpers on these old cards, and how it affects the setup parameters

6. Refer back to Section 4 of this document where the OPTIONS from the old board were recorded. All of the features that used to be referred to as OPTIONS are now all STANDARD features in the Burny 2.5 Plus—there are no special option codes to enter. However, 2 of these old OPTION capabilities require a setting of one of the setup parameters to either ENABLE or DISABLE the feature.

COMM ENHANCE OPTION

Parameter SD51 now has a bit to control the COMM ENHANCE OPTION. This is an 8 digit parameter--for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the COMM ENHANCE option was ON with the old board, set digit D3 of the SD51 parameter to 0. (xx0xxxxx). This will cause the COMM ENHANCE to function on the new card.

- If the COMM ENHANCE option was OFF with the old board, set digit D3 of parameter SD51 to an "8" to disable the COMM ENHANCE feature on the new board— (xx8xxxxx).

KNIFE KERF OPTION

Parameter SD63 now has a bit to control the KNIFE KERF OPTION. Knife kerf is a special mode for the kerf routine that is used by the sign making industry for the special requirements of the drag knife used for cutting vinyl material, or for router cutting of plastic and aluminum for signs.

This is an 8 digit parameter-- for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the KNIFE KERF option was ON with the old board, set digit D3 of the SD63 parameter to a 1. (xx1xxxxx). This will cause the KNIFE KERF to function on the new card.

- If the KNIFE KERF option was OFF with the old board, set digit D3 of parameter SD51 to an "0" to disable the KNIFE KERF feature on the new board— (xx0xxxxx).

7. Press the hidden SERVICE button again, and access the SERV41 overlay table list. Go back to section 2.2.1 of this document and re-enter all the parameters saved from the SERV41 list in the old control.

8. Press the hidden SERVICE button again, and access the SERV42 overlay table list. Go back to section 2.3.1 of this document and re-enter all the parameters saved from the SERV42 list in the old control.

9. Press the hidden SERVICE button again, and access the SERV43 overlay table list. Go back to section 2.4.1 of this document and re-enter all the parameters saved from the SERV43 list in the old control.

10. Press the hidden SERVICE button again, and access the SERV44 overlay table list. Go back to section 2.5.1 of this document and re-enter all the parameters saved from the SERV44 list in the old control.

11. Press the hidden SERVICE button again, and access the SERV45 overlay table list. Go back to section 2.6.1 of this document and re-enter all the parameters saved from the SERV45 list in the old control.

12. Press the hidden SERVICE button and perform the SERV97 procedure to store the new parameters so they will not be lost when the power is turned off.

13. Press the hidden SERVICE button and select the SERV51-SPD CAL function—press ENTER to select the function, but DO NOT follow the prompts on the screen regarding the CYCLE START button. Instead, press the hidden SERVICE button again, and now select the SERV97 function and store the cleared speed calibration data.

14. Press the hidden SERVICE button and access the SERV78-CUSTOM AUX code conversion table. Go back to section 3.1.1 and re-enter all the data saved for the Custom AUX table from the old control. The procedure would be to press the ENTER button to get to the next AUX location, then press ENTER again to access the TVVFF entry screen. Enter the TVVFF code saved from the old control (32005) and press ENTER. You can scroll back to a previous entry to check it if desired.

15. The control should now be operational. Turn on the servo drives and test the motion of the machine. See the manual that came with this update kit for details on the new setup parameters for help in adjusting the machine's performance.

8. Appendix A – DIP Switch settings for older Burny 2.5 Front Panels

Older front panels for the Burny 2.5, as well as several of the private labeled versions did not include the 4 Directional JOG ARROWS as shown in the pictures. These panels used a sequence of pressing the II button, then used the numbered keyboard to select the jog direction.

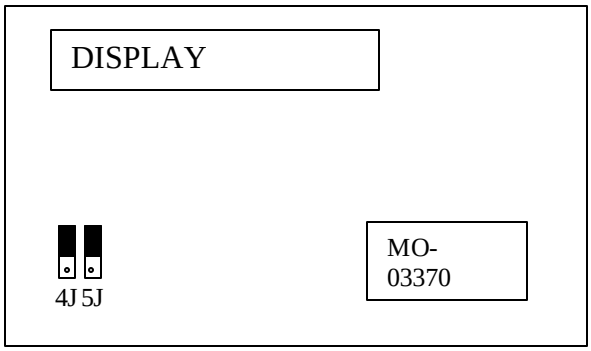
To configure the new MO-12438 board to work correctly with these older panels, the DIP switches must be set to match the configuration jumpers from the old boards.

DIP switch settings for MO-03370 processor card replacement

SW1 – ON
SW2 – OFF
SW3 – OFF
SW4 – Set to ON if Jumper 4J is set AWAY from the display.
Set to OFF if Jumper 4J is set TOWARD the display.

SW5 – Set to ON if Jumper 5J is set AWAY from the display.
Set to OFF if Jumper 5J is set TOWARD the display.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-04873 or MO-04875 processor card replacement

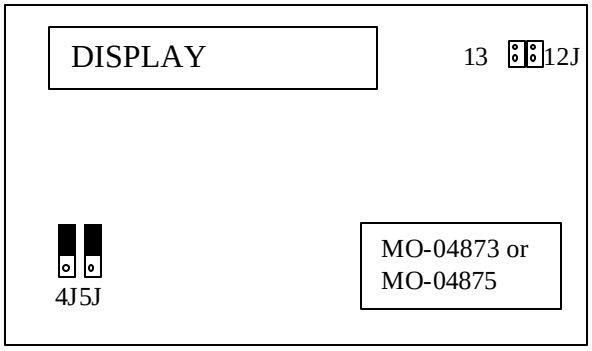
SW1 – ON
SW2 – Set to OFF if Jumper 12J is missing,
Set to ON if jumper J12 is installed

SW3 – Set to OFF if Jumper 13J is missing,
Set to ON if jumper J13 is installed

SW4 – Set to ON if Jumper 4J is set AWAY from the readout.
Set to OFF if Jumper 4J is set TOWARD the readout.

SW5 – Set to ON if Jumper 5J is set AWAY from the readout.
Set to OFF if Jumper 5J is set TOWARD the readout.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-08601 or MO-11249 processor card replacement

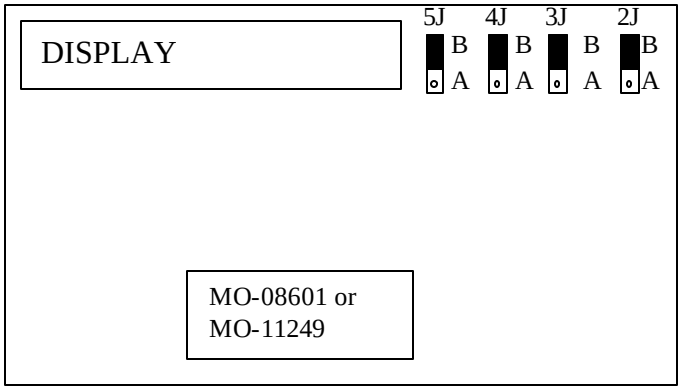
SW1 – ON
SW2– Set to OFF if Jumper J2 is set to “A”,
Set to ON if Jumper J2 is set to “B”

SW3– Set to OFF if Jumper J3 is set to “A”,
Set to ON if Jumper J3 is set to “B”

SW4– Set to OFF if Jumper J4 is set to “A”,
Set to ON if Jumper J4 is set to “B”

SW5– Set to OFF if Jumper J5 is set to “A”,
Set to ON if Jumper J5 is set to “B”

SW6, SW7, SW8 – All set to OFF



9. Appendix B – Changes to Encoder Scaling for older 2.5 updates

The older MO-03370, MO-04873 and MO-04875 processor cards included hardware jumpers J6 thru J9 on the card. These were used to tolerate faster encoder counting frequencies that could not be handled by the hardware. The newer 2.5 processor cards use faster encoder counting circuitry and eliminated these jumpers.

If one of these older boards (3370,4873,4875) are being replaced, the setting of these jumpers can affect the parameters entered into the new MO-12438 card.

If all 4 of the jumpers J6,J7,J8 and J9 are set toward the display (See Fig. 1), then the setup parameters from the old board can be directly entered into the new card.

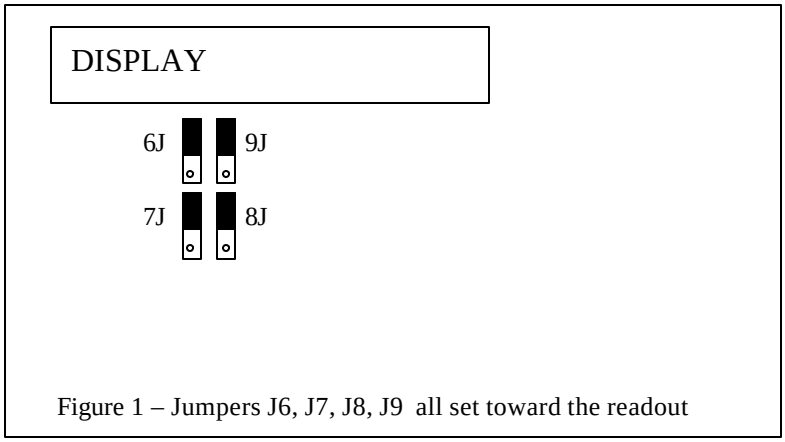


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

Some installations may be using faster encoders, particularly motor mounted encoders, and may have these jumpers set the opposite direction. If all 4 of the jumpers J6,J7, J8, J9 (Figure 2) are set away from the DISPLAY, then the value recorded for parameter SD22- ENC LINES/REV must be multiplied by 4. So for example, a system where the old card had a setting of 500 for SD22 would need to have 2000 entered into the new MO-12438 to work properly.

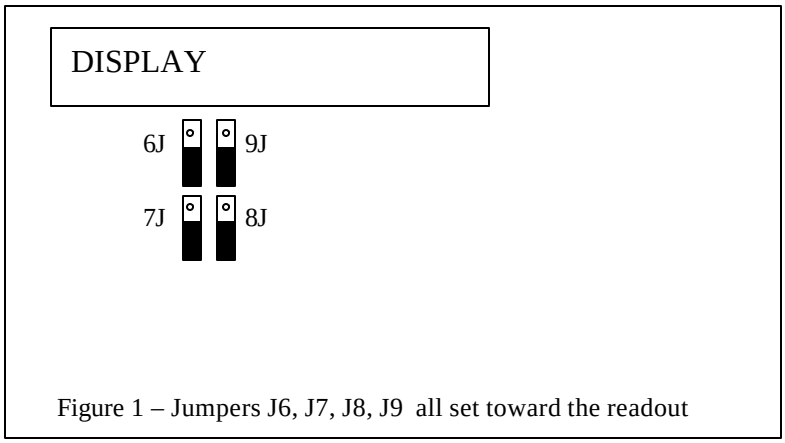


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

If the old system has jumpers J6, J7, J8, J9 set to any other random pattern, contact the factory since this will require modifying several of the system parameters. This is very uncommon.

10. Appendix C "Burny 2.5 Plus-- New features and Capabilities"

The goal of the 2.5 Plus development program was to produce a new version of the computer board in the Burny 2.5 series products that would improve the speed and system performance, without affecting the basic operation. The 2.5 Plus processor card will perform RS-232 downloads, and the Kerf calculations 80-90% faster than the older cards.

Most of the prompting, displays and operator inputs are exactly the same as the older cards—so there is little or no re-training required when the new 2.5 Plus card is substituted for an older card. However, there is the problem that the 2.5 Plus basically copies the operation of the Burny 2.5 software that was in existence at the end of 1999. If the older 2.5 card had software dating back many years (could go back as far as 1988), then there will be substantial differences in the machine's operation due to the changes and improvements that have occurred over the years of software development on the Burny 2.5 product line. This may require some additional training for the operators to become familiar with the new operation of the control, and the new capabilities available to the operator. See the new OPERATION MANUAL supplied along with this Burny 2.5 Plus product for details on all the current features of the product.

The two main areas where a difference will be noted are in the Serial I/O downloading speeds, and the Kerf processing speed.

Kerf Processing speed

The Kerf process is self contained within the Burny 2.5 Plus—there is no interaction with the outside world so the process can function at peak efficiency.

Serial I/O Downloading Speed

The Serial I/O downloading is a different matter. Since the Serial I/O communication via the RS-232/422 port connects to devices outside the Burny product, the performance of the downloading system is very dependent on the performance and setting of the external devices. For example, if the existing cutting machine had the BAUD rate set to 2400 Baud for the serial downloading speed, there will be NO increase in performance of the Serial Downloading speed with the Burny 2.5 Plus—the older card work just as well at 2400 baud as the new 2.5 Plus card. To fully take advantage of the new downloading speed capacity of the Burny 2.5 Plus card, the external system must be capable of supplying the data faster also. The following is an ESTIMATE of the speed improvement expected for various Baud rate settings of the Burny 2.5 Plus. Note that the higher baud rate settings were not even possible with the older Burny 2.5 which was normally used up to about 4800 baud.

Serial I/O Downloading Baud Rate setting	ESTIMATED speed improvement with Burny 2.5 Plus.
300 to 2400 Baud	0%-- Same speed as older card
4800 Baud	25% Less time for download
9600 Baud	60% Less time for download
19.2K Baud	80% Less time for download
28.8K Baud	80% Less time for download
38.4K Baud	75% Less time for download
57.6K to 230K Baud	60-75% Less time—note that these very high baud rates require more system overhead and are actually LESS EFFICIENT than the somewhat slower settings from 19.2K to 38.4K Baud

Serial Number and Option codes

The Burny 2.5 Plus software does not use Option codes—all possible features for the product are available as Standard capabilities with every system that ships. Similarly, there is no longer a SERIAL NUMBER imbedded into the product—the display will show " SERIAL 0" for all Burny 2.5 Plus products. The main purpose for the Serial number was to control the software lockout codes for the options—no more options means no more serial number.

The fact that all Options are now standard will cause some new menus and displays to show up on older controls where a particular option was missing before. For example, if an older Burny 2.8 did not have the STANDARD SHAPES option installed, there would not have been a menu choice for "LOAD-STANDARD SHAPE" in the select function list. When the 2.5 Plus card is installed, the operator will now see this "LOAD- STANDARD SHAPE" prompt – this should be explained to the operator ahead of time to avoid possible confusion.

The following is a list of the features that will now appear on all controls—the ones marked ** may have been missing from the older card—they are now provided as a standard capability of the new Burny 2.5 Plus software:

- RUN- PROGRAM
- LOAD- FROM STD SHAPE ** (Older card required Standard Shape option to be enabled)
- LOAD- FROM RS-232 ** (Older card required Serial I/O Option to be enabled)
- STORE- TO RS-232 ** (Older card required Serial I/O Option to be enabled)
- TEACH- PROGRAM ** (Older card required Teach Option to be enabled)
- DELETE-PROGRAM
- EDIT-PROGRAM ** (Very old cards could only access EDIT via DSPY20-)
- LOAD- FROM FLOPPY ** (Older cards required Floppy option to be enabled)
- STORE- TO FLOPPY ** (Older cards required Floppy option to be enabled)
- LOAD/RUN- RS-232 ** (Older cards required Serial I/O option to be enabled)
- LOAD/RUN-FLOPPY ** (Older cards required Floppy option to be enabled)

Some operators may complain that they have to Scroll through too many choices in this new expanded list of features to get what they want. Remember that these choices can be made with a single button push as described in the operation manual— as a reminder, the following number keys select the indicted function:

- RUN- PROGRAM -- Press the number 1 on the keypad
- LOAD- FROM STD SHAPE -- Press the number 2 on the keypad
- LOAD- FROM RS-232 -- Press the number 3 on the keypad
- STORE- TO RS-232 -- Press the number 4 on the keypad
- TEACH- PROGRAM -- Press the number 5 on the keypad
- DELETE-PROGRAM -- Press the number 6 on the keypad
- EDIT-PROGRAM -- Press the number 7 on the keypad
- LOAD- FROM FLOPPY -- Press the number +/- on the keypad
- STORE- TO FLOPPY -- Press the number . (decimal point) on the keypad
- LOAD/RUN- RS-232 -- Press the number 3, then the SHF on the keypad
- LOAD/RUN-FLOPPY -- Press the +/- key, then the SHF on the keypad

Blank

Burny 2.5 PLUS Update

Installation instructions for field upgrades using the Burny 2.5 PLUS processor card.

Also for use with MO-12685 and MO-12742 upgrade kits

ECO REVISION HISTORY

Revision	*Description*	*ECO*	*Date*
-AA	Written	---	28-July-00
-BA	Add photos, DIP Switch and parameter for old cards	CLE1716	07-Dec-00

Spec No.:	*Division:* BURNY
Author: RDM	*Rev:* **BA**
File name: AO-90177BA.doc	*Date:* **7-Dec-2000**

Cleveland Motion Controls
An IMC Company

REVISION HISTORY

Rev AA	RDM (28-July-2000) -- Written
Rev BA	JRB (7-Dec-2000) -- Added retrofit Figures and references
	RDM(7-Dec-2000) -- Add APPENDIX A,B for Dip switch settings for older front panels, and APPENDIX B for modifications needed to Encoder Scaling parameters when MO-3370 or 4873 or 4875 board was replaced.

TABLE OF CONTENTS

1. INTRODUCTION

These instructions document the steps needed to update existing Burny 2.5 controls, or any of the other Series 2 controls (1250,1400, 2.8, 2.9) with the new MO-12438 Burny 2.5 Plus processor card. The procedure assumes the installer is familiar with the Burny products and is capable of the mechanical assembly/disassembly and entry of parameters into the system.

For updates on a Burny 1250 or Burny 1400 system, the original keyboard can still be used—just the processor card is replaced as described in the following procedures.

For Burny 2.5, Burny 2.8 or Burny 2.9 systems, a special part number MO-12685 has been created to provide a new processor card with the new 2.5 Plus keyboard. This is necessary since the older Burny 2.5 keyboards do not have the proper clearance in the aluminum panel for the current readout used on the Burny 2.5 products. By ordering this MO-12685 kit, the installer is assured of having a panel that works fits the readout.

The main purpose of this particular procedure is to document all of the stored parameters, option codes, Aux code conversion tables, etc. which are configured in the existing Series 2 control BEFORE the new processor card is installed. Once the new card is operational, this stored data from the old system will be re-entered with the goal of making the new card capable of running the machine in as little time as possible.

2. PARAMETER and SYSTEM DATA RETRIEVAL

Before disassembling anything, the installer must first retrieve all the data stored in the existing Burny 2.5 system. There is no automatic way to do this with the older software, therefore the data must be manually obtained. The following pages have procedures and tables to be used to write down the parameter data, Code Conversion table data, and options enabled in the current system. Then, after the new processor card and panel are installed, these values must be manually re-entered into the new system. If this process is done correctly, and attention is paid to getting the data correct, the new system should begin operation with no further tuning required.

2.1 System Data Parameters-SERV10

With the existing system operating normally, press the hidden "SERVICE" button and access SERV10-SYS DATA. Press ENTER to display the main system parameter list. The display shows the first parameter as:

SD01-ARC ON DELAY

Press the ENTER button a second time to display the value currently set for this parameter—if the Arc On delay had been set for 3 seconds, the display would now show:

AONDLY = 3.00

Write down this 3.00 value in the following table. Press the ENTER button to access the next parameter name, and then press the ENTER button a second time to access the value—the display would have showed:

SD02-BLEEDOFF then BLEDOF= 2.00 (2 seconds used for this example)

Continue stepping through the entire list of parameters and write their values in the able provided.

IMPORTANT: Older systems may not include all the parameters shown on this list.

Older systems had less parameters than the current Burny 2.5—therefore it is important to carefully pay attention to the parameter number displayed on the screen, and match it to the table before writing the value. Any parameters that were not included in the old system will be handled during the installation portion for the new card.

2.1.1 SERV10 PARAMETERS

Parameter Number and Name	PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN	Default value to be used for older systems where a parameter was not part of the older products list.	Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system
SD01- ARC ON TIME	ARCDLY =		
SD02- BLEEDOFF	BLEDOF =		
SD03- ACCEL TIME	ACCTME =		
SD04- MAX DRV SPD	MAXSPD =		
SD06- BACKUP SPD	BCKSPD =		
SD07- CORNER SPD	CORSPD =		
SD08- MIN HLD SPD	MINHLD =		
SD09- ERR SPD MAX	ERRSPD =	20 inch/min 400 mm/min	

SD10- RUNSPD LIMIT	RUNLMT =		
SD11- TRAVERS LMT	TRVLMT =		
SD12- MIN ACCEL	MIN ACCEL =	.20 seconds	
SD14- GAIN BREAK	GAIN BREAK =	0	
SD15- ERR WRN DST	WRNDST =		
SD16- LOOP GAIN	LPGAIN =		
SD17- ARC OFF DLY	AOFDLY =	2.0 seconds	
SD18- SLWDWN DIST	SLWDST =		
SD19- DISABL DIST	DISABL =	.25 inches 6.3 mm	
SD20- X ENC DIST	XENSCL =		
SD21- Y ENC DIST	YENSCL =		
SD22- ENC LIN/REV	ENC LINES =		
SD23- X ENC DIR	X ENC DIR -		
SD24- Y ENC DIR	Y ENC DIR -		
SD25- X DRV DIR	X DRV DIR -		
SD26- Y DRV DIR	Y DRV DIR -		
SD27- PLATE SIDE	PLATE ON -		
SD28- HEIGHT RLY	CONTACT -		
SD29- SLWDWN RAD	SLWRAD =		
SD30- MIN RAD SPD	MRADSP =	30 inches/min 150 mm/min	
SD31- PLASMA TB1	PLASMA TB1 =	NO	
SD32- MIN SLW ANG	MINSLW =	10	
SD33- MAX SLW ANG	MAXSLW =	22	
SD40- X MARK OFF	XOFST1 =		
SD41- Y MARK OFF	YOFST1 =		
SD42- MARKER SPD	MRKSPD =		
SD43- MARK DELAY	MRKDLY =		
SD45- DEFLT DWELL	DFDWEL =		
SD46- MIN OFF DWL	MINOFF =		
SD47- XOFST2	XOFST2 =		

SD48- YOFST2	YOFST2=		
SD49- START DELAY	STRDLY =	1.5 seconds	
SD50- SERIAL DEFN	SERIAL DEFN =		
SD5- PRGM FORMAT	PGMFMT =		
SD52- SPECIAL EOP	EOP 1 =		
SD53- FILE EXTEN	FEXTEN =	434E4300	
SD60- OPER SYS	OPER SYS =		
SD61- SYS CONFG 1	SYSCFG1 =		
SD62- SYS CONFG 2	SYSCFG2 =		
SD63- SYS CONFG 3	SYSCFG3 =	0	
SD65- OVERLAY CFG	OVERLAY CFG =	0	
SD68- SPEED RANGE	SPEED RANGE =	4	
SD69- LA NGUAGE	LANGUAGE =	0	
SD70- KNF ROT DIA	KNFDIA =		
SD71- KNF B.P. ANG	KNF B.P. ANG =		
SD74- T2XHOM	T2XHOM =		
SD75-T2YHOM	T2YHOM =		
SD76- T3XHOM	T3XHOM =		
SD77- T3YHOM	T3YHOM =		
SD78- T4XHOM	T4XHOM =		
SD79- T4YHOM	T4YHOM =		
SD80- XOFST1	XOFST1 =		
SD81- XOFST1	YOFST1 =		
SD82- XOFST2	XOFST2 =		
SD83- XOFST2	YOFST2 =		
SD84- XOFST3	XOFST3 =		
SD85- XOFST3	YOFST3 =		
SD86- XOFST4	XOFST4 =		
SD87- XOFST4	YOFST4 =		
SD88- XOFST5	XOFST5 =		

SD89- XOFST5	YOFST5 =		
SD90- XOFST6	XOFST6 =		
SD91- XOFST6	YOFST6 =		
SD92- XOFST7	XOFST7 =		
SD93- XOFST7	YOFST7 =		
SD94- XOFST8	XOFST8 =		
SD95- XOFST8	YOFST8 =		
SD96- XHOMSW	XHOMSW =		
SD97- XHOMSW	YHOMSW =		
SDA0- XBKLSH	XBKLSH =	0	
SDA1- YBKLSH	YBKLSH =	0	
SDA2- LSH RATE	LSH RATE =		
SDD0- SYNC W-AXIS	SYNC ENABLE =	NO	
SDD1- W GAIN	W GAIN =		
SDD2- SKEW LIMT	SKWLMT =		
SDD3- W MAX SPD	WMXSPD =		
SDD4- W ENC DIR	W ENCODER =		
SDD5- W DRV DIR	W DRIVE =		
SDD6- WBKLSH	WBKLSH =		
SDD7 – W OFFSET	WOFSET =		

2.2 System Overlay Table #1 Parameters - SERV41

Burny 2.5 systems built after 1983 had the 5 sets of additional setup parameters which could be selected by programming codes within a part program to "overlay" the standard SERV10 parameter list. Access this list of values by pressing the hidden "SERVICE" button and access SERV41-TB 1 DATA. Press ENTER to display the overlay table #1 list. Note this list is much shorter than the SERV10 list. Again, carefully step down through the list and write the values in the following list:

2.2.1 SERV41 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
1-03- ACCEL TIME	ACCTME =		
1-07- CORNER SPD	CORSPD =		
1-10- RUNSPD LIMIT	RUNLMT =		
1-12- MIN ACCEL	MIN ACCEL =		
1-14- GAIN BREAK	GAIN BREAK =		
1-16- LOOP GAIN	LPGAIN =		
1-18- SLWDWN DIST	SLWDST =		
1-19- DISABL DIST	DISABL =		
1-29- SLWDWN RAD	SLWRAD =		
1-30- MIN RAD SPD	MRADSP =		
1-32- MIN SLW ANG	MINSLW =		
1-33- MAX SLW ANG	MAXSLW =		
1-45- DEFLT DWELL	DFDWEL =		
1-46- MIN OFF DWL	MINOFF =		
1-49- START DELAY	STRDLY =		

2.3 System Overlay Table #2 Parameters - SERV42

Continue with this process to access the data in Overlay Table #2 by pressing the hidden "SERVICE" button and access SERV42-TB 2 DATA. Press ENTER to display the overlay table #2 list.

2.3.1 SERV42 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
2-03- ACCEL TIME	ACCTME =		
2-07- CORNER SPD	CORSPD =		
2-10- RUNSPD LIMIT	RUNLMT =		
2-12- MIN ACCEL	MIN ACCEL =		
2-14- GAIN BREAK	GAIN BREAK =		
2-16- LOOP GAIN	LPGAIN =		
2-18- SLWDWN DIST	SLWDST =		
2-19- DISABL DIST	DISABL =		
2-29- SLWDWN RAD	SLWRAD =		
2-30- MIN RAD SPD	MRADSP =		
2-32- MIN SLW ANG	MINSLW =		
2-33- MAX SLW ANG	MAXSLW =		
2-45- DEFLT DWELL	DFDWEL =		
2-46- MIN OFF DWL	MINOFF =		
2-49- START DELAY	STRDLY =		

2.4 System Overlay Table #3 Parameters - SERV43

Continue with this process to access the data in Overlay Table #3 by pressing the hidden "SERVICE" button and access SERV43-TB 3 DATA. Press ENTER to display the overlay table #3 list.

2.4.1 SERV43 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
3-03- ACCEL TIME	ACCTME =		
3-07- CORNER SPD	CORSPD =		
3-10- RUNSPD LIMIT	RUNLMT =		
3-12- MIN ACCEL	MIN ACCEL =		
3-14- GAIN BREAK	GAIN BREAK =		
3-16- LOOP GAIN	LPGAIN =		
3-18- SLWDWN DIST	SLWDST =		
3-19- DISABL DIST	DISABL =		
3-29- SLWDWN RAD	SLWRAD =		
3-30- MIN RAD SPD	MRADSP =		
3-32- MIN SLW ANG	MINSLW =		
3-33- MAX SLW ANG	MAXSLW =		
3-45- DEFLT DWELL	DFDWEL =		
3-46- MIN OFF DWL	MINOFF =		
3-49- START DELAY	STRDLY =		

2.5 System Overlay Table #4 Parameters - SERV44

Continue with this process to access the data in Overlay Table #4 by pressing the hidden "SERVICE" button and access SERV44-TB 4 DATA. Press ENTER to display the overlay table #4 list.

2.5.1 SERV44 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
4-03- ACCEL TIME	ACCTME =		
4-07- CORNER SPD	CORSPD =		
4-10- RUNSPD LIMIT	RUNLMT =		
4-12- MIN ACCEL	MIN ACCEL =		
4-14- GAIN BREAK	GAIN BREAK =		
4-16- LOOP GAIN	LPGAIN =		
4-18- SLWDWN DIST	SLWDST =		
4-19- DISABL DIST	DISABL =		
4-29- SLWDWN RAD	SLWRAD =		
4-30- MIN RAD SPD	MRADSP =		
4-32- MIN SLW ANG	MINSLW =		
4-33- MAX SLW ANG	MAXSLW =		
4-45- DEFLT DWELL	DFDWEL =		
4-46- MIN OFF DWL	MINOFF =		
4-49- START DELAY	STRDLY =		

2.6 System Overlay Table #5 Parameters - SERV45

Continue with this process to access the data in Overlay Table #5 by pressing the hidden "SERVICE" button and access SERV45-TB 5 DATA. Press ENTER to display the overlay table #5 list.

2.6.1 SERV54 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
5-03- ACCEL TIME	ACCTME =		
5-07- CORNER SPD	CORSPD =		
5-10- RUNSPD LIMIT	RUNLMT =		
5-12- MIN ACCEL	MIN ACCEL =		
5-14- GAIN BREAK	GAIN BREAK =		
5-16- LOOP GAIN	LPGAIN =		
5-18- SLWDWN DIST	SLWDST =		
5-19- DISABL DIST	DISABL =		
5-29- SLWDWN RAD	SLWRAD =		
5-30- MIN RAD SPD	MRADSP =		
5-32- MIN SLW ANG	MINSLW =		
5-33- MAX SLW ANG	MAXSLW =		
5-45- DEFLT DWELL	DFDWEL =		
5-46- MIN OFF DWL	MINOFF =		
5-49- START DELAY	STRDLY =		

3. Retrieving Custom Aux Table Data – SERV78

The Burny 2.5 has the ability to convert the M and G or ESSI auxiliary functions in a part program into the functional codes needed by the Burny to cut the part. The data for making this conversion is contained in a list accessed by pressing the hidden "SERVICE" button, and then selecting the SERV78-CUSTOM AUX utility. Press ENTER to access the first entry in the list. There are 2 display formats used with this list—when the table is first accessed, the display will be in the "Table position" mode which shows which of the 50 possible entries is being displayed, and the current setting for that table location:

AUX01-M20-CUTOFF

This indicates that the first table location "AUX01" contains the data to convert an M20 code from a word address program into an internal Cut Off function—turn the oxygen or plasma off at the end of a cut.

Pressing ENTER at this point changes the display to show the TVVFF code for the AUX01 entry—the display will appear as:

32005-M20-CUTOFF

The 32005 is the TVVFF code:

T -- a single digit that defines the type of code begin converted (1-ESSI, 2-G code, 3-M code)

VV – a 2 or 3 digit value (up to 127) that defines the numeric value for the code (20 in this example)

FF – a 2 digit code defining the internal function assigned to the code (see Burny 2.5 manual for the list)

It is NOT necessary to understand what all these codes do to install the Burny 2.5 Plus processor card--- the important thing is to get them written down in the following chart so they can be re-entered in the new control.

The procedure would be to step through the list for each of the AUX entries and write down the data displayed for the block and the TVVFF displays.

While this list contains a maximum of 50 entries, the number of AUX table entries is usually much less. The end of the list is indicated by a display of a location being AVAILABLE. This means that no data has been entered for this table entry—the Burny will not search the table past this AVAILABLE location therefore any data following the first AVAILABLE location is not needed—it would not affect the controls operation in any way.

Begin stepping through the list and write down the data in the following chart:

3.1.1 AUX CODE TABLE DATA

Table location display: Example: AUX01 – M20 – CUT OFF	TVVFF display Example:32005 – M20 – CUT OFF
AUX01 -- --	-- --
AUX02 -- --	-- --
AUX03 -- --	-- --

AUX04	--	--	--	--
AUX05	--	--	--	--
AUX06	--	--	--	--
AUX07	--	--	--	--
AUX08	--	--	--	--
AUX09	--	--	--	--
AUX10	--	--	--	--
AUX11	--	--	--	--
AUX12	--	--	--	--
AUX13	--	--	--	--
AUX14	--	--	--	--
AUX15	--	--	--	--
AUX16	--	--	--	--
AUX17	--	--	--	--
AUX18	--	--		
AUX19	--	--		
AUX20	--	--		
AUX21	--	--		
AUX22	--	--		
AUX23	--	--		
AUX24	--	--		
AUX25	--	--		
AUX26	--	--		
AUX27	--	--		
AUX28	--	--		
AUX29	--	--		
AUX30	--	--		
AUX31	--	--		
AUX32	--	--	--	--
AUX33	--	--	--	--
AUX34	--	--	--	--
AUX35	--	--	--	--
AUX36	--	--	--	--

AUX37	--	--	--	--	
AUX38	--	--			
AUX39	--	--			
AUX40	--	--			
AUX41	--	--			
AUX42	--	--			
AUX43	--	--			
AUX44	--	--			
AUX45	--	--			
AUX46	--	--			
AUX47	--	--			
AUX48	--	--			
AUX49	--	--			
AUX50	--	--			

4. OPTION CODES

All of the Burny 2.5 and related Series 2 controls have various software options that are enabled by special "Lockout" codes based on the serial number of the control. While the new Burny 2.5 Plus card has all "options" now loaded as standard features, the Option Settings for the old board must be documented to determine some of the parameter settings on the new board.

There are two ways that this is done, depending on the age of the software in the existing control.

4.1 Option code display on very old systems.

Very old systems only display the options as a coded text string during power-up. The control will turn on and go through it's normal tests, and then display a text string as:

OPTN- C2D4007000

Each digit in this display references a particular option.

Turn the power Off, and back On to the control, and wait for this string to appear—then record the value in the following spaces (it may take several cycles of power Off/On to get the entire string written down correctly).

OPTN										

4.2 Option code display on newer Burny 2.5 (Series 2) systems

Controls with more recent software will have a display function called DSPY80 which tells the ON/OFF status of each option directly on the screen. Press the DSPY button and select DSPY80. When the ENTER button is pressed, the display will first show a sequence of values showing the serial number, hardware type and how much memory is used. Press the ENTER button during this sequence and the display will change to show:

OPTIONS

KERF --- ON or KERF --- OFF

Pressing enter will step down through this list and show the status of each option as ON or OFF. Record these values in the following chart for later use. Some of these options may not appear in the list since they are now considered "standard"—the chart has locations for them to make the recording process easier

4.2.1 Option ON/OFF status

OPTION NAME	ON/OFF
KERF	
SCALE	
ROTATE	
MIRROR	
PLATE ALIGN	
SERIAL COMM	
COMM ENHANCE	
CAD LINK	
PLATE MARKER	
STD. SHAPES	
TEACH	
KNIFE KERF	
CUSTOM AUX.	
LANGUAGE or individual language such as SPANISH, FRENCH, GERMAN, etc.	
FLOPPY DRIVE	
PRG. FDRT/KRF (programmable feedrate and kerf)	

5. BACKUP PART PROGRAMS

The final section of data that must be transferred from the existing Burny 2.5 to the new Burny 2.5 PLUS card are the stored part programs in the control. Part programs could have been created by either loading a Standard Shape, Template Teach, Downloading a program from the serial port or a Floppy, or creating a program using the Editor.

When the old processor card is removed from the system, these programs will be lost unless they are backed up to some external device. Some customers will already have all of their programs stored on the host computer, so there is no need to backup the data from the Burny 2.5. However, other customers will have programs created by template teach, that are only stored in the Burny 2.5's memory—these programs should be backed up if possible.

This can be done in two ways.

If the system is equipped with a serial port, and the external computing device can accept program uploads, use the STORE function in the Burny 2.5 to store to the RS-232 port and send all the internal programs up to the host computer.

If the system is equipped with an internal or external Floppy Disk drive, use the STORE function in the Burny 2.5 and store the programs to a series of floppy disks so they can be reloaded into the new card.

6. Power Off—Swap processor cards

Now that all the data from the existing Burny 2.5 processor card has either been stored to some external device, or recorded on this document on the lists provided, the old card can be removed, and the new card installed.

IMPORTANT: Remove all sources of AC power to the machine before performing any service work. The main power disconnect should be turned off and Locked in the OFF state to prevent someone from accidentally turning the power back on during the service operation.

WARNING: Proper handling procedures must be followed when installing the new MO-12438 Burny 2.5PLUS processor card. This card contains many high speed, high density electronic devices that can be damaged by STATIC ELECTRICITY caused by improper handling. Before removing the card from it's protective bag, the installing technician MUST use a grounded anti-static wrist strap connected to the machine chassis. All sources of STATIC ELECTRICITY should be removed from the area (any styrofoam, plastic packing material, bubble wrap, plastic paper sleeve protectors, etc). Once the board is removed from it's protective bag, it should be installed directly into the Burny system—do not lay it on a table or other surface that may not be grounded.

**The existing Burny 2.5 processor card should be placed back into the same protective anti-static bag after it is removed from the system. **

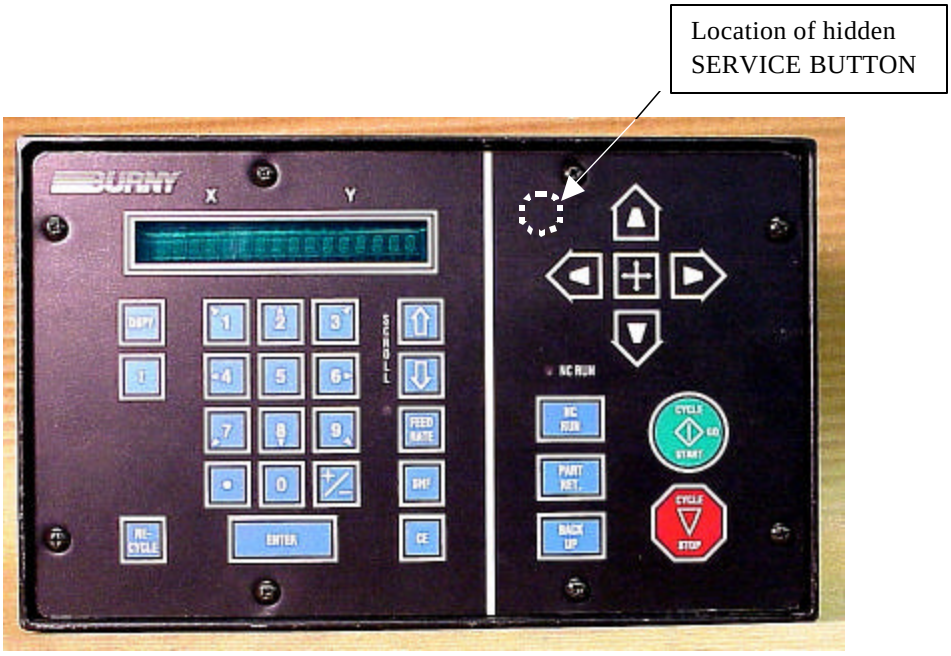


Figure 1- Typical Burny 2.5 Front Panel

Card installation:

1. Remove all sources of AC power to the machine, and lock-out the power disconnect to the machine to prevent accidental re-application of AC power during the service process.

2. Connect a grounded anti-static wrist strap to the machine frame and place it on the wrist of the installing technician.

3. Remove the screws holding the front panel of the product. For the Burny 2.5, these are the 8 screws around the keyboard panel. On the 1250 and 1400, there are 8 to 10 screws holding in the entire front hinged door. And finally, on the Burny 2.8, there are 22 screws holding the entire top cover of the cabinet—remove all but the bottom 4 screws along the lower front edge of the cabinet—just loosen the front 4 screws and lift the lid out of the slotted holes. See Figure 1.

4. Once the screws are removed, lay the front panel open so the screws holding the interface card to the processor card can be accessed.

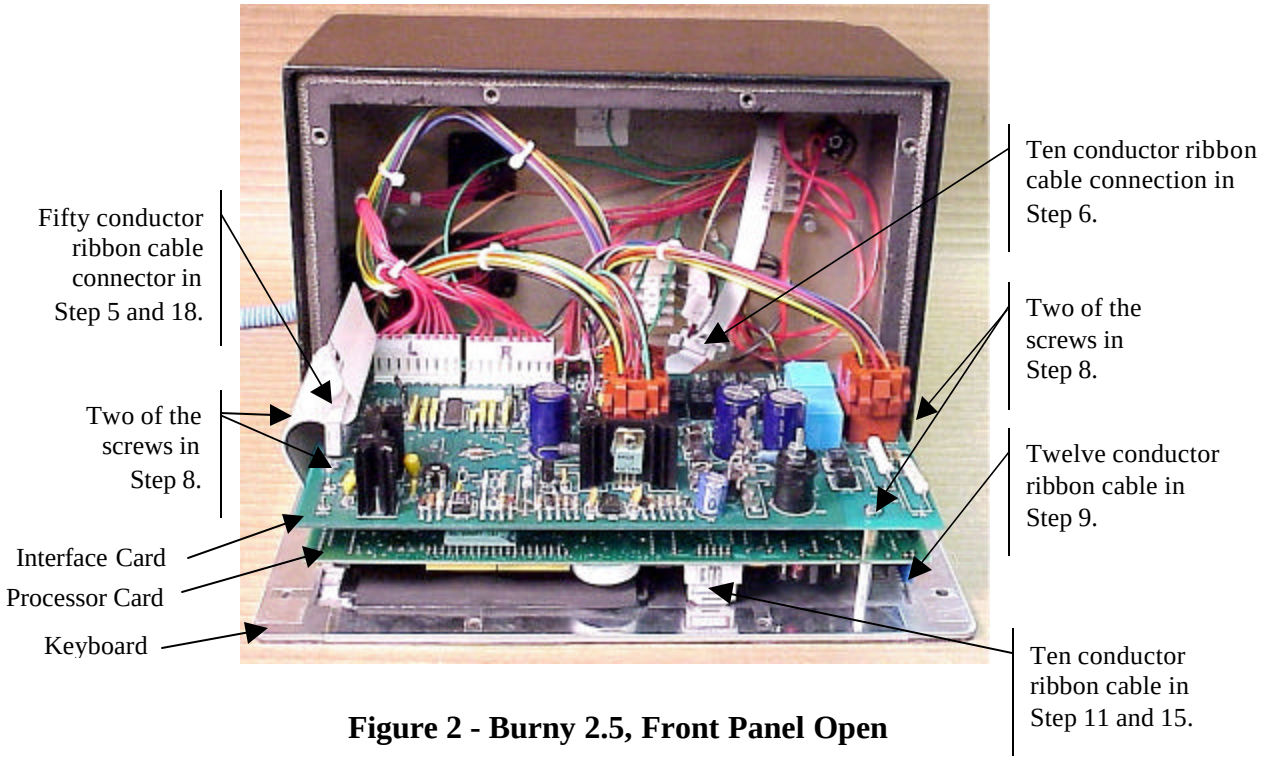


Figure 2 - Burny 2.5, Front Panel Open

5. Unplug the large 50 conductor ribbon cable that runs from the processor card to the interface card. See Figure 2.

6. Disconnect the 10 conductor ribbon cable from the processor card to the RS-232/422 modem. See Figure 2.

7. If installed, unplug the 14 conductor ribbon cable that runs from the processor card to the optional home limit switch input card used on some Burny 2.5 and 2.8 systems. See Figure 3.

8. Remove the 4 screws holding the interface card to the processor card in the system. This will make the interface and the processor card free floating so take care not to drop or stress the wires in the system during

this step. See Figure 2.

9. Lift the processor card slightly away from the keyboard panel, and unplug the 12 conductor ribbon that runs from the keyboard panel to the processor. See Figure 2.

10. Remove the old processor card from the system.

11. Remove the short 10 and/or 14 conductor ribbon cables from the old processor card—these will be re-used with the new card. See Figure 3.

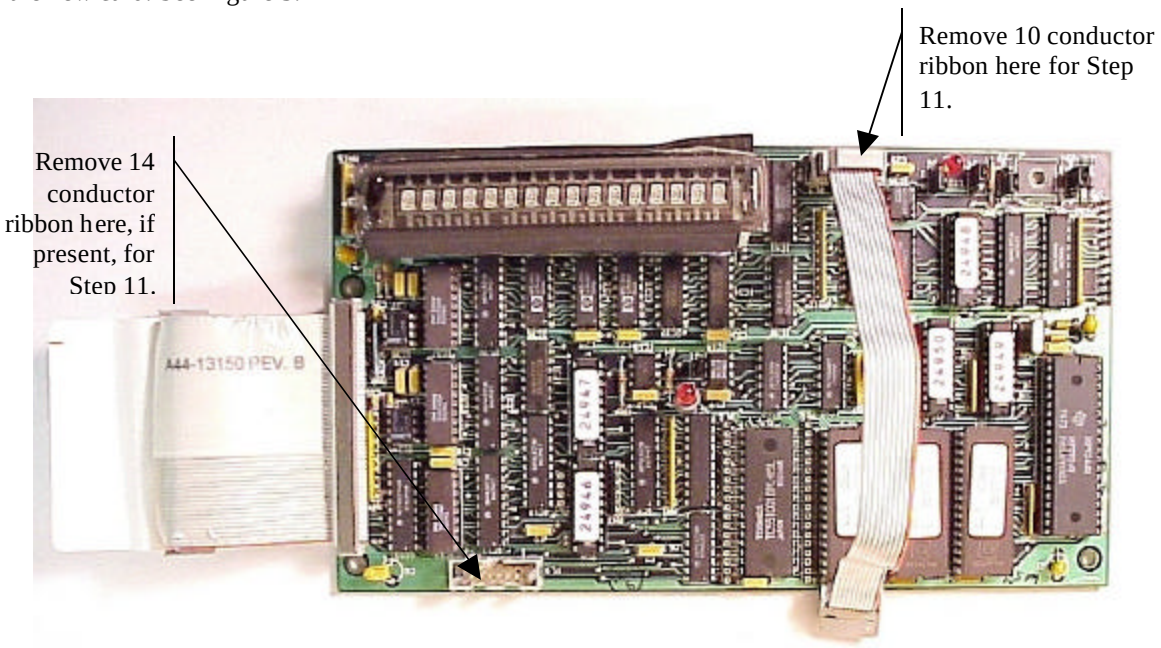


Figure 3 - Burny 2.5 Existing Processor Board

12. If a Burny 2.8 is being updated, remove the old keyboard by removing the 6 screws around the bezel on the front of the unit and discarding the old keyboard. Install the new keyboard supplied with the updated kit using the same screws and bezel as the old panel.

13. If a Burny 2.5 is being updated, discard the old keyboard. Use the new keyboard supplied with the update kit.

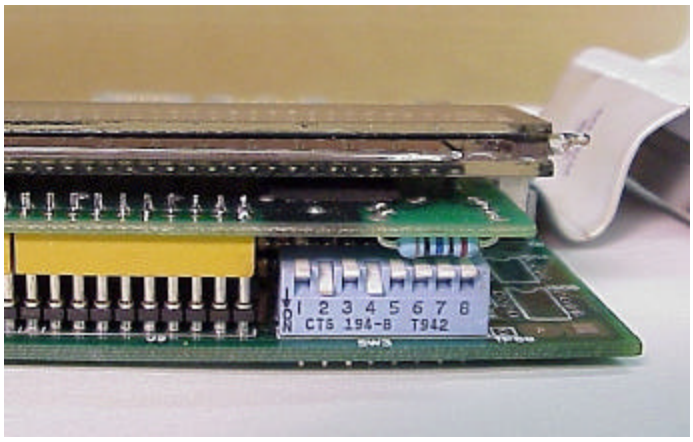


Figure 4 - DIP Switch in Step 14

14. Remove the new MO-12438 processor card from it's protective bag. See Figure 5 and 9. Set the DIP switch located on the new card under the readout as follows:

    - When using the MO-12438 card with any of the Burny 2.5 type keyboards that include the **4 DIRECTIONAL JOG ARROWS,** or with a **Burny 1250** or **Burny 1400** keyboard which also include the jog arrow buttons, the DIP switch on the MO-12438 **MUST** be set as follows:

      Position 1 -- OFF
      Position 2 -- ON
      Position 3 -- OFF
      Position 4 -- ON
      Position 5 -- OFF
      Position 6 -- OFF
      Position 7 -- OFF
      Position 8 -- OFF

      See Figure 4 -- these are the proper jumper settings when used with the new Burny 2.5 Plus front panel.

    - See APPENDIX A for details and precautions for using the MO-12438 card with older style Burny 2.5, 2.8 and private label keyboard panels.

15. Re-connect the 10 and/or 14 conductor ribbon cables to the new processor card—the connectors for these cables are located in almost the exact same location as the old card. Take care that the 10 pin cable for the serial RS-232/422 port is connected to the J4 connector on the new card. There is another 10 pin connector on the new processor card that will be used for software updates—but it will not function for the RS-232 port use. See Figure 5.

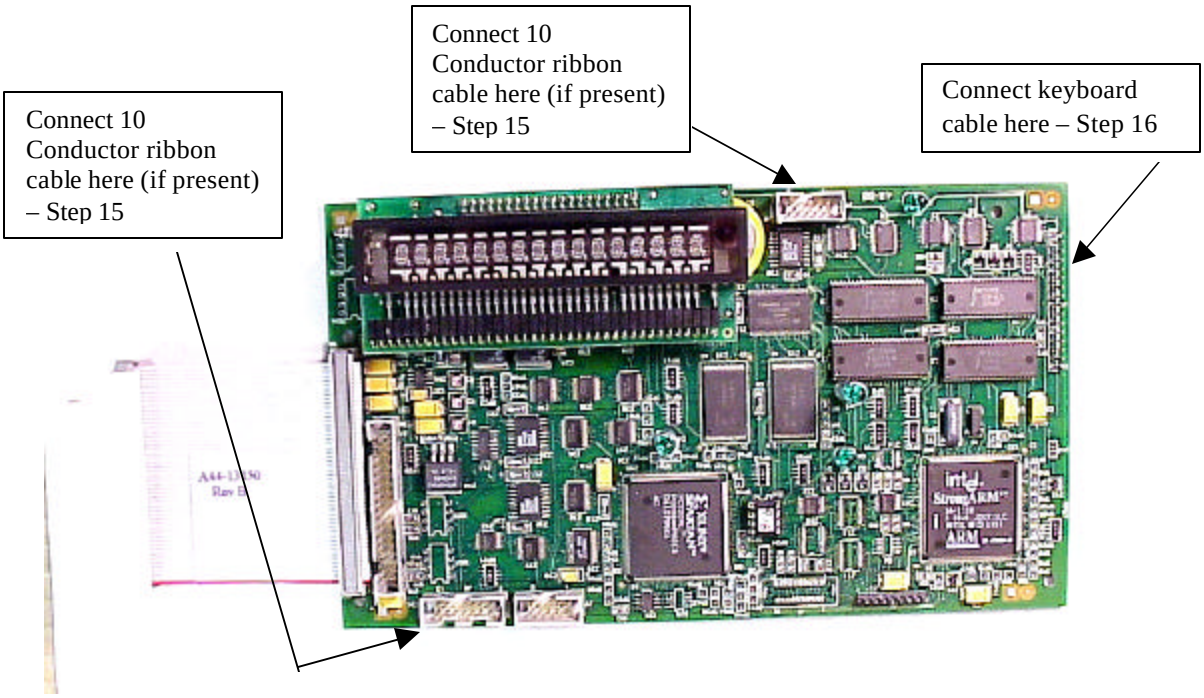


Figure 5 - Front of New Processor Board

16. Place the new MO-12438 card over the keyboard, and connect the ribbon from the keyboard to the J1 connector on the new processor card. Be sure to apply the ribbon connector starting at pin 1 of the J1 connector—the new processor card has some extra pins included in the J1 connector for future expansion—the older keyboards must be connected to the original 12 input pins. Also make sure the 10 or 14 conductor additional ribbon cables are routed under the card properly and are not pinched or interfering with the LED's or other devices.

17. Align the interface card and new processor over the keyboard standoffs, and replace the 4 screws to hold these two boards together.

18. Connect the 10, 14 and 50 conductor ribbon cables to their respective locations in the system. See Figure 2.

19. Replace the keyboard in the cabinet on 2.5 systems, close the door on the 1250/1400 or replace the 2.8's cabinet lid and replace the screws to hold in the panel or door. Make sure all screws are tight to insure a dust tight seal around the opening.

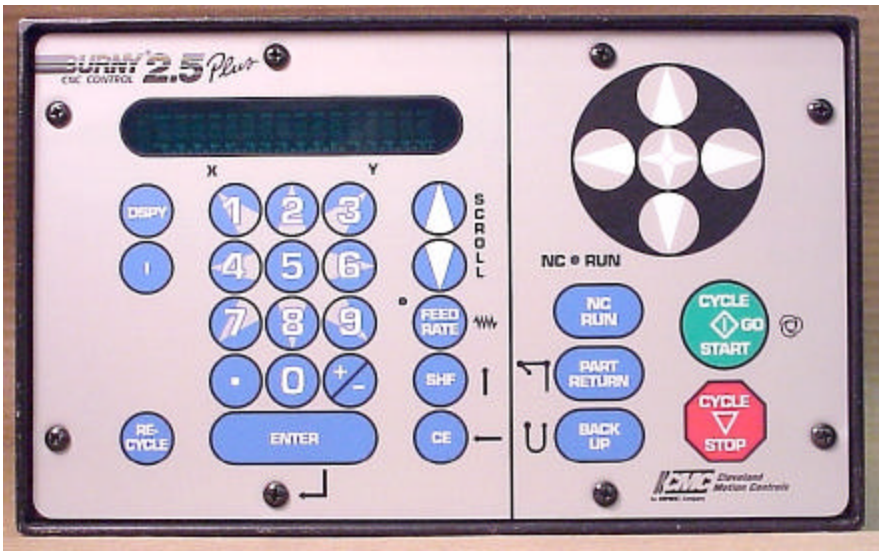


Figure 6 - Burny 2.5 *Plus* Front Panel

20. Remove the wrist strap now that the new card is installed and the cabinet is closed

21. Continue with this procedure to re-install all the data needed to make the new board function on the machine.

7. Power ON – Re-install saved data

Now that the mechanical installation of the new card is complete, the new card must be configured to run the system and act the same as the card that was removed. There will be some changes in the operation of the controls since you are updating the software to the most recent software version as a result of this card exchange. Consult the new Burny 2.5 operation manual supplied with the update kit for details on how to operate the new features.

1. Re-Apply AC power to the cutting machine and turn on the Burny system if there is a separate switch. The control should power up normally and display the familiar READY --- SELECT FUNCTION message.

2. DO NOT enable the servo drives for the system. If possible, disengage the pinion gears from the drive rack so that the machine. This is done as a precaution until it is confirmed that the parameters are working correctly in the new system.

3. Verify that the keyboard works properly. Try several operations to verify that most of the keys work correctly.

4. Press the hidden SERVICE button and select the SERV52- MEM RESET. Press ENTER and answer YES to both prompts to reset the program storage memory. After the process is done, use the DSPY80 function to display the amount of memory Used and Available. There should be almost 512K bytes available—this is the standard memory size on the MO-12438 Burny 2.5 Plus processor card.

5. Press the hidden SERVICE button and access the SERV10 parameter list. GO back to section 2.1.1 of this document and enter all the parameters in the SERV10 list. ALL PARAMETERS must be entered into the new card—do not skip any of the entries. If a value was not found in the old card, there is a suggested DEFAULT value in the table that should be entered into the new card. After the system is running, these new parameters may need to be re-adjusted to give optimal machine performance—see the new manual shipped with the update for details on the new parameter settings.

SPECIAL REQUIREMENTS FOR OLDER SYSTEMS

If the MO-12438 is being used to replace the older MO-03370, MO-4873, or MO-04875 processor cards—see APPENDIX B for information regarding the encoder scaling jumpers on these old cards, and how it affects the setup parameters

6. Refer back to Section 4 of this document where the OPTIONS from the old board were recorded. All of the features that used to be referred to as OPTIONS are now all STANDARD features in the Burny 2.5 Plus—there are no special option codes to enter. However, 2 of these old OPTION capabilities require a setting of one of the setup parameters to either ENABLE or DISABLE the feature.

COMM ENHANCE OPTION

Parameter SD51 now has a bit to control the COMM ENHANCE OPTION. This is an 8 digit parameter--for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the COMM ENHANCE option was ON with the old board, set digit D3 of the SD51 parameter to 0. (xx0xxxxx). This will cause the COMM ENHANCE to function on the new card.

- If the COMM ENHANCE option was OFF with the old board, set digit D3 of parameter SD51 to an "8" to disable the COMM ENHANCE feature on the new board— (xx8xxxxx).

KNIFE KERF OPTION

Parameter SD63 now has a bit to control the KNIFE KERF OPTION. Knife kerf is a special mode for the kerf routine that is used by the sign making industry for the special requirements of the drag knife used for cutting vinyl material, or for router cutting of plastic and aluminum for signs.

This is an 8 digit parameter-- for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the KNIFE KERF option was ON with the old board, set digit D3 of the SD63 parameter to a 1. (xx1xxxxx). This will cause the KNIFE KERF to function on the new card.

- If the KNIFE KERF option was OFF with the old board, set digit D3 of parameter SD51 to an "0" to disable the KNIFE KERF feature on the new board— (xx0xxxxx).

7. Press the hidden SERVICE button again, and access the SERV41 overlay table list. Go back to section 2.2.1 of this document and re-enter all the parameters saved from the SERV41 list in the old control.

8. Press the hidden SERVICE button again, and access the SERV42 overlay table list. Go back to section 2.3.1 of this document and re-enter all the parameters saved from the SERV42 list in the old control.

9. Press the hidden SERVICE button again, and access the SERV43 overlay table list. Go back to section 2.4.1 of this document and re-enter all the parameters saved from the SERV43 list in the old control.

10. Press the hidden SERVICE button again, and access the SERV44 overlay table list. Go back to section 2.5.1 of this document and re-enter all the parameters saved from the SERV44 list in the old control.

11. Press the hidden SERVICE button again, and access the SERV45 overlay table list. Go back to section 2.6.1 of this document and re-enter all the parameters saved from the SERV45 list in the old control.

12. Press the hidden SERVICE button and perform the SERV97 procedure to store the new parameters so they will not be lost when the power is turned off.

13. Press the hidden SERVICE button and select the SERV51-SPD CAL function—press ENTER to select the function, but DO NOT follow the prompts on the screen regarding the CYCLE START button. Instead, press the hidden SERVICE button again, and now select the SERV97 function and store the cleared speed calibration data.

14. Press the hidden SERVICE button and access the SERV78-CUSTOM AUX code conversion table. Go back to section 3.1.1 and re-enter all the data saved for the Custom AUX table from the old control. The procedure would be to press the ENTER button to get to the next AUX location, then press ENTER again to access the TVVFF entry screen. Enter the TVVFF code saved from the old control (32005) and press ENTER. You can scroll back to a previous entry to check it if desired.

15. The control should now be operational. Turn on the servo drives and test the motion of the machine. See the manual that came with this update kit for details on the new setup parameters for help in adjusting the machine's performance.

8. Appendix A – DIP Switch settings for older Burny 2.5 Front Panels

Older front panels for the Burny 2.5, as well as several of the private labeled versions did not include the 4 Directional JOG ARROWS as shown in the pictures. These panels used a sequence of pressing the II button, then used the numbered keyboard to select the jog direction.

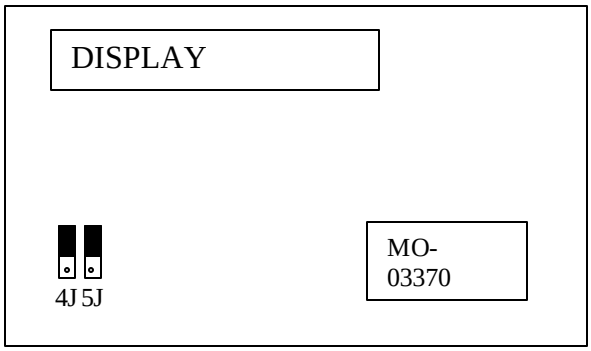
To configure the new MO-12438 board to work correctly with these older panels, the DIP switches must be set to match the configuration jumpers from the old boards.

DIP switch settings for MO-03370 processor card replacement

SW1 – ON
SW2 – OFF
SW3 – OFF
SW4 – Set to ON if Jumper 4J is set AWAY from the display.
Set to OFF if Jumper 4J is set TOWARD the display.

SW5 – Set to ON if Jumper 5J is set AWAY from the display.
Set to OFF if Jumper 5J is set TOWARD the display.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-04873 or MO-04875 processor card replacement

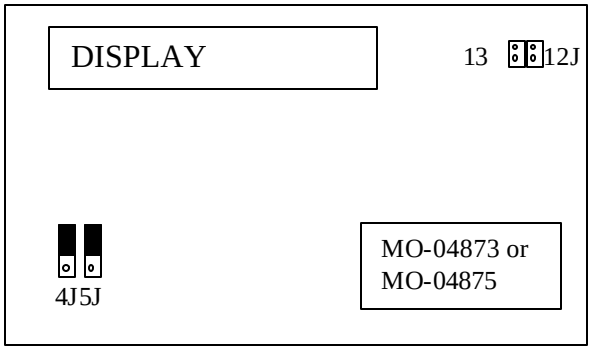
SW1 – ON
SW2 – Set to OFF if Jumper 12J is missing,
Set to ON if jumper J12 is installed

SW3 – Set to OFF if Jumper 13J is missing,
Set to ON if jumper J13 is installed

SW4 – Set to ON if Jumper 4J is set AWAY from the readout.
Set to OFF if Jumper 4J is set TOWARD the readout.

SW5 – Set to ON if Jumper 5J is set AWAY from the readout.
Set to OFF if Jumper 5J is set TOWARD the readout.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-08601 or MO-11249 processor card replacement

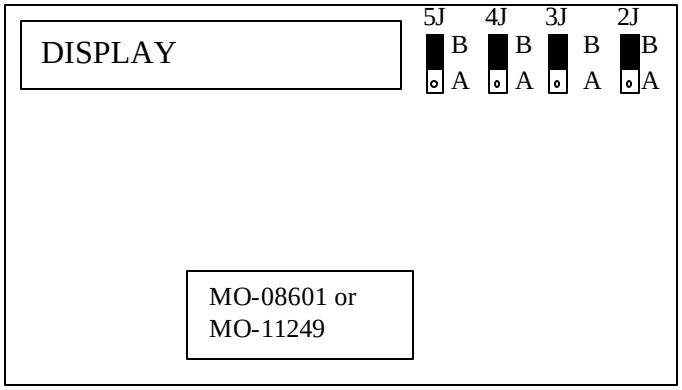
SW1 – ON
SW2– Set to OFF if Jumper J2 is set to “A”,
Set to ON if Jumper J2 is set to “B”

SW3– Set to OFF if Jumper J3 is set to “A”,
Set to ON if Jumper J3 is set to “B”

SW4– Set to OFF if Jumper J4 is set to “A”,
Set to ON if Jumper J4 is set to “B”

SW5– Set to OFF if Jumper J5 is set to “A”,
Set to ON if Jumper J5 is set to “B”

SW6, SW7, SW8 – All set to OFF



9. Appendix B – Changes to Encoder Scaling for older 2.5 updates

The older MO-03370, MO-04873 and MO-04875 processor cards included hardware jumpers J6 thru J9 on the card. These were used to tolerate faster encoder counting frequencies that could not be handled by the hardware. The newer 2.5 processor cards use faster encoder counting circuitry and eliminated these jumpers.

If one of these older boards (3370,4873,4875) are being replaced, the setting of these jumpers can affect the parameters entered into the new MO-12438 card.

If all 4 of the jumpers J6,J7,J8 and J9 are set toward the display (See Fig. 1), then the setup parameters from the old board can be directly entered into the new card.

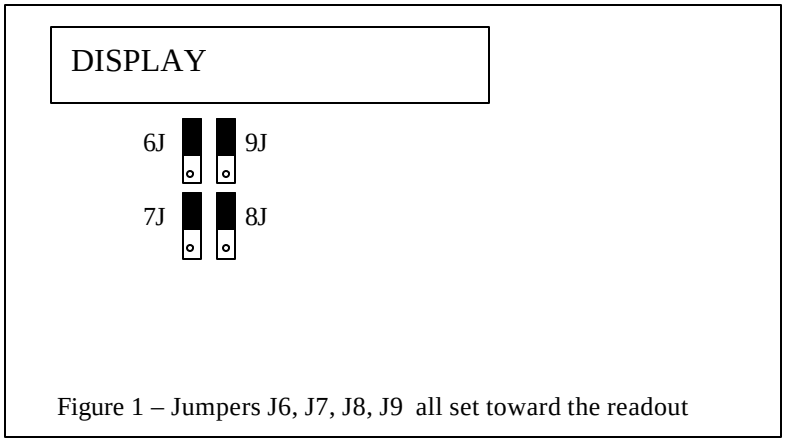


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

Some installations may be using faster encoders, particularly motor mounted encoders, and may have these jumpers set the opposite direction. If all 4 of the jumpers J6,J7, J8, J9 (Figure 2) are set away from the DISPLAY, then the value recorded for parameter SD22- ENC LINES/REV must be multiplied by 4. So for example, a system where the old card had a setting of 500 for SD22 would need to have 2000 entered into the new MO-12438 to work properly.

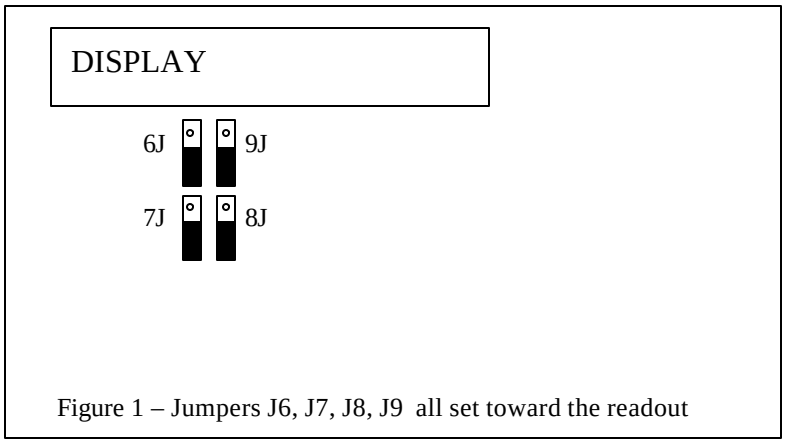


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

If the old system has jumpers J6, J7, J8, J9 set to any other random pattern, contact the factory since this will require modifying several of the system parameters. This is very uncommon.

10. Appendix C "Burny 2.5 Plus-- New features and Capabilities"

The goal of the 2.5 Plus development program was to produce a new version of the computer board in the Burny 2.5 series products that would improve the speed and system performance, without affecting the basic operation. The 2.5 Plus processor card will perform RS-232 downloads, and the Kerf calculations 80-90% faster than the older cards.

Most of the prompting, displays and operator inputs are exactly the same as the older cards—so there is little or no re-training required when the new 2.5 Plus card is substituted for an older card. However, there is the problem that the 2.5 Plus basically copies the operation of the Burny 2.5 software that was in existence at the end of 1999. If the older 2.5 card had software dating back many years (could go back as far as 1988), then there will be substantial differences in the machine's operation due to the changes and improvements that have occurred over the years of software development on the Burny 2.5 product line. This may require some additional training for the operators to become familiar with the new operation of the control, and the new capabilities available to the operator. See the new OPERATION MANUAL supplied along with this Burny 2.5 Plus product for details on all the current features of the product.

The two main areas where a difference will be noted are in the Serial I/O downloading speeds, and the Kerf processing speed.

Kerf Processing speed

The Kerf process is self contained within the Burny 2.5 Plus—there is no interaction with the outside world so the process can function at peak efficiency.

Serial I/O Downloading Speed

The Serial I/O downloading is a different matter. Since the Serial I/O communication via the RS-232/422 port connects to devices outside the Burny product, the performance of the downloading system is very dependent on the performance and setting of the external devices. For example, if the existing cutting machine had the BAUD rate set to 2400 Baud for the serial downloading speed, there will be NO increase in performance of the Serial Downloading speed with the Burny 2.5 Plus—the older card work just as well at 2400 baud as the new 2.5 Plus card. To fully take advantage of the new downloading speed capacity of the Burny 2.5 Plus card, the external system must be capable of supplying the data faster also. The following is an ESTIMATE of the speed improvement expected for various Baud rate settings of the Burny 2.5 Plus. Note that the higher baud rate settings were not even possible with the older Burny 2.5 which was normally used up to about 4800 baud.

Serial I/O Downloading Baud Rate setting	ESTIMATED speed improvement with Burny 2.5 Plus.
300 to 2400 Baud	0%-- Same speed as older card
4800 Baud	25% Less time for download
9600 Baud	60% Less time for download
19.2K Baud	80% Less time for download
28.8K Baud	80% Less time for download
38.4K Baud	75% Less time for download
57.6K to 230K Baud	60-75% Less time—note that these very high baud rates require more system overhead and are actually LESS EFFICIENT than the somewhat slower settings from 19.2K to 38.4K Baud

Serial Number and Option codes

The Burny 2.5 Plus software does not use Option codes—all possible features for the product are available as Standard capabilities with every system that ships. Similarly, there is no longer a SERIAL NUMBER imbedded into the product—the display will show " SERIAL 0" for all Burny 2.5 Plus products. The main purpose for the Serial number was to control the software lockout codes for the options—no more options means no more serial number.

The fact that all Options are now standard will cause some new menus and displays to show up on older controls where a particular option was missing before. For example, if an older Burny 2.8 did not have the STANDARD SHAPES option installed, there would not have been a menu choice for "LOAD-STANDARD SHAPE" in the select function list. When the 2.5 Plus card is installed, the operator will now see this "LOAD- STANDARD SHAPE" prompt – this should be explained to the operator ahead of time to avoid possible confusion.

The following is a list of the features that will now appear on all controls—the ones marked ** may have been missing from the older card—they are now provided as a standard capability of the new Burny 2.5 Plus software:

- RUN- PROGRAM
- LOAD- FROM STD SHAPE ** (Older card required Standard Shape option to be enabled)
- LOAD- FROM RS-232 ** (Older card required Serial I/O Option to be enabled)
- STORE- TO RS-232 ** (Older card required Serial I/O Option to be enabled)
- TEACH- PROGRAM ** (Older card required Teach Option to be enabled)
- DELETE-PROGRAM
- EDIT-PROGRAM ** (Very old cards could only access EDIT via DSPY20-)
- LOAD- FROM FLOPPY ** (Older cards required Floppy option to be enabled)
- STORE- TO FLOPPY ** (Older cards required Floppy option to be enabled)
- LOAD/RUN- RS-232 ** (Older cards required Serial I/O option to be enabled)
- LOAD/RUN-FLOPPY ** (Older cards required Floppy option to be enabled)

Some operators may complain that they have to Scroll through too many choices in this new expanded list of features to get what they want. Remember that these choices can be made with a single button push as described in the operation manual— as a reminder, the following number keys select the indicted function:

- RUN- PROGRAM -- Press the number 1 on the keypad
- LOAD- FROM STD SHAPE -- Press the number 2 on the keypad
- LOAD- FROM RS-232 -- Press the number 3 on the keypad
- STORE- TO RS-232 -- Press the number 4 on the keypad
- TEACH- PROGRAM -- Press the number 5 on the keypad
- DELETE-PROGRAM -- Press the number 6 on the keypad
- EDIT-PROGRAM -- Press the number 7 on the keypad
- LOAD- FROM FLOPPY -- Press the number +/- on the keypad
- STORE- TO FLOPPY -- Press the number . (decimal point) on the keypad
- LOAD/RUN- RS-232 -- Press the number 3, then the SHF on the keypad
- LOAD/RUN-FLOPPY -- Press the +/- key, then the SHF on the keypad

Blank

Burny 2.5 PLUS Update

Installation instructions for field upgrades using the Burny 2.5 PLUS processor card.

Also for use with MO-12685 and MO-12742 upgrade kits

ECO REVISION HISTORY

Revision	*Description*	*ECO*	*Date*
-AA	Written	---	28-July-00
-BA	Add photos, DIP Switch and parameter for old cards	CLE1716	07-Dec-00

Spec No.:	*Division:* BURNY
Author: RDM	*Rev:* **BA**
File name: AO-90177BA.doc	*Date:* **7-Dec-2000**

Cleveland Motion Controls
An IMC Company

REVISION HISTORY

Rev AA	RDM (28-July-2000) -- Written
Rev BA	JRB (7-Dec-2000) -- Added retrofit Figures and references
	RDM(7-Dec-2000) -- Add APPENDIX A,B for Dip switch settings for older front panels, and APPENDIX B for modifications needed to Encoder Scaling parameters when MO-3370 or 4873 or 4875 board was replaced.

TABLE OF CONTENTS

1. INTRODUCTION

These instructions document the steps needed to update existing Burny 2.5 controls, or any of the other Series 2 controls (1250,1400, 2.8, 2.9) with the new MO-12438 Burny 2.5 Plus processor card. The procedure assumes the installer is familiar with the Burny products and is capable of the mechanical assembly/disassembly and entry of parameters into the system.

For updates on a Burny 1250 or Burny 1400 system, the original keyboard can still be used—just the processor card is replaced as described in the following procedures.

For Burny 2.5, Burny 2.8 or Burny 2.9 systems, a special part number MO-12685 has been created to provide a new processor card with the new 2.5 Plus keyboard. This is necessary since the older Burny 2.5 keyboards do not have the proper clearance in the aluminum panel for the current readout used on the Burny 2.5 products. By ordering this MO-12685 kit, the installer is assured of having a panel that works fits the readout.

The main purpose of this particular procedure is to document all of the stored parameters, option codes, Aux code conversion tables, etc. which are configured in the existing Series 2 control BEFORE the new processor card is installed. Once the new card is operational, this stored data from the old system will be re-entered with the goal of making the new card capable of running the machine in as little time as possible.

2. PARAMETER and SYSTEM DATA RETRIEVAL

Before disassembling anything, the installer must first retrieve all the data stored in the existing Burny 2.5 system. There is no automatic way to do this with the older software, therefore the data must be manually obtained. The following pages have procedures and tables to be used to write down the parameter data, Code Conversion table data, and options enabled in the current system. Then, after the new processor card and panel are installed, these values must be manually re-entered into the new system. If this process is done correctly, and attention is paid to getting the data correct, the new system should begin operation with no further tuning required.

2.1 System Data Parameters-SERV10

With the existing system operating normally, press the hidden "SERVICE" button and access SERV10-SYS DATA. Press ENTER to display the main system parameter list. The display shows the first parameter as:

SD01-ARC ON DELAY

Press the ENTER button a second time to display the value currently set for this parameter—if the Arc On delay had been set for 3 seconds, the display would now show:

AONDLY = 3.00

Write down this 3.00 value in the following table. Press the ENTER button to access the next parameter name, and then press the ENTER button a second time to access the value—the display would have showed:

SD02-BLEEDOFF then BLEDOF= 2.00 (2 seconds used for this example)

Continue stepping through the entire list of parameters and write their values in the able provided.

IMPORTANT: Older systems may not include all the parameters shown on this list.

Older systems had less parameters than the current Burny 2.5—therefore it is important to carefully pay attention to the parameter number displayed on the screen, and match it to the table before writing the value. Any parameters that were not included in the old system will be handled during the installation portion for the new card.

2.1.1 SERV10 PARAMETERS

Parameter Number and Name	PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN	Default value to be used for older systems where a parameter was not part of the older products list.	Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system
SD01- ARC ON TIME	ARCDLY =		
SD02- BLEEDOFF	BLEDOF =		
SD03- ACCEL TIME	ACCTME =		
SD04- MAX DRV SPD	MAXSPD =		
SD06- BACKUP SPD	BCKSPD =		
SD07- CORNER SPD	CORSPD =		
SD08- MIN HLD SPD	MINHLD =		
SD09- ERR SPD MAX	ERRSPD =	20 inch/min 400 mm/min	

SD10- RUNSPD LIMIT	RUNLMT =		
SD11- TRAVERS LMT	TRVLMT =		
SD12- MIN ACCEL	MIN ACCEL =	.20 seconds	
SD14- GAIN BREAK	GAIN BREAK =	0	
SD15- ERR WRN DST	WRNDST =		
SD16- LOOP GAIN	LPGAIN =		
SD17- ARC OFF DLY	AOFDLY =	2.0 seconds	
SD18- SLWDWN DIST	SLWDST =		
SD19- DISABL DIST	DISABL =	.25 inches 6.3 mm	
SD20- X ENC DIST	XENSCL =		
SD21- Y ENC DIST	YENSCL =		
SD22- ENC LIN/REV	ENC LINES =		
SD23- X ENC DIR	X ENC DIR -		
SD24- Y ENC DIR	Y ENC DIR -		
SD25- X DRV DIR	X DRV DIR -		
SD26- Y DRV DIR	Y DRV DIR -		
SD27- PLATE SIDE	PLATE ON -		
SD28- HEIGHT RLY	CONTACT -		
SD29- SLWDWN RAD	SLWRAD =		
SD30- MIN RAD SPD	MRADSP =	30 inches/min 150 mm/min	
SD31- PLASMA TB1	PLASMA TB1 =	NO	
SD32- MIN SLW ANG	MINSLW =	10	
SD33- MAX SLW ANG	MAXSLW =	22	
SD40- X MARK OFF	XOFST1 =		
SD41- Y MARK OFF	YOFST1 =		
SD42- MARKER SPD	MRKSPD =		
SD43- MARK DELAY	MRKDLY =		
SD45- DEFLT DWELL	DFDWEL =		
SD46- MIN OFF DWL	MINOFF =		
SD47- XOFST2	XOFST2 =		

SD48- YOFST2	YOFST2=		
SD49- START DELAY	STRDLY =	1.5 seconds	
SD50- SERIAL DEFN	SERIAL DEFN =		
SD5- PRGM FORMAT	PGMFMT =		
SD52- SPECIAL EOP	EOP 1 =		
SD53- FILE EXTEN	FEXTEN =	434E4300	
SD60- OPER SYS	OPER SYS =		
SD61- SYS CONFG 1	SYSCFG1 =		
SD62- SYS CONFG 2	SYSCFG2 =		
SD63- SYS CONFG 3	SYSCFG3 =	0	
SD65- OVERLAY CFG	OVERLAY CFG =	0	
SD68- SPEED RANGE	SPEED RANGE =	4	
SD69- LA NGUAGE	LANGUAGE =	0	
SD70- KNF ROT DIA	KNFDIA =		
SD71- KNF B.P. ANG	KNF B.P. ANG =		
SD74- T2XHOM	T2XHOM =		
SD75-T2YHOM	T2YHOM =		
SD76- T3XHOM	T3XHOM =		
SD77- T3YHOM	T3YHOM =		
SD78- T4XHOM	T4XHOM =		
SD79- T4YHOM	T4YHOM =		
SD80- XOFST1	XOFST1 =		
SD81- XOFST1	YOFST1 =		
SD82- XOFST2	XOFST2 =		
SD83- XOFST2	YOFST2 =		
SD84- XOFST3	XOFST3 =		
SD85- XOFST3	YOFST3 =		
SD86- XOFST4	XOFST4 =		
SD87- XOFST4	YOFST4 =		
SD88- XOFST5	XOFST5 =		

SD89- XOFST5	YOFST5 =		
SD90- XOFST6	XOFST6 =		
SD91- XOFST6	YOFST6 =		
SD92- XOFST7	XOFST7 =		
SD93- XOFST7	YOFST7 =		
SD94- XOFST8	XOFST8 =		
SD95- XOFST8	YOFST8 =		
SD96- XHOMSW	XHOMSW =		
SD97- XHOMSW	YHOMSW =		
SDA0- XBKLSH	XBKLSH =	0	
SDA1- YBKLSH	YBKLSH =	0	
SDA2- LSH RATE	LSH RATE =		
SDD0- SYNC W-AXIS	SYNC ENABLE =	NO	
SDD1- W GAIN	W GAIN =		
SDD2- SKEW LIMT	SKWLMT =		
SDD3- W MAX SPD	WMXSPD =		
SDD4- W ENC DIR	W ENCODER =		
SDD5- W DRV DIR	W DRIVE =		
SDD6- WBKLSH	WBKLSH =		
SDD7 – W OFFSET	WOFSET =		

2.2 System Overlay Table #1 Parameters - SERV41

Burny 2.5 systems built after 1983 had the 5 sets of additional setup parameters which could be selected by programming codes within a part program to "overlay" the standard SERV10 parameter list. Access this list of values by pressing the hidden "SERVICE" button and access SERV41-TB 1 DATA. Press ENTER to display the overlay table #1 list. Note this list is much shorter than the SERV10 list. Again, carefully step down through the list and write the values in the following list:

2.2.1 SERV41 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
1-03- ACCEL TIME	ACCTME =		
1-07- CORNER SPD	CORSPD =		
1-10- RUNSPD LIMIT	RUNLMT =		
1-12- MIN ACCEL	MIN ACCEL =		
1-14- GAIN BREAK	GAIN BREAK =		
1-16- LOOP GAIN	LPGAIN =		
1-18- SLWDWN DIST	SLWDST =		
1-19- DISABL DIST	DISABL =		
1-29- SLWDWN RAD	SLWRAD =		
1-30- MIN RAD SPD	MRADSP =		
1-32- MIN SLW ANG	MINSLW =		
1-33- MAX SLW ANG	MAXSLW =		
1-45- DEFLT DWELL	DFDWEL =		
1-46- MIN OFF DWL	MINOFF =		
1-49- START DELAY	STRDLY =		

2.3 System Overlay Table #2 Parameters - SERV42

Continue with this process to access the data in Overlay Table #2 by pressing the hidden "SERVICE" button and access SERV42-TB 2 DATA. Press ENTER to display the overlay table #2 list.

2.3.1 SERV42 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
2-03- ACCEL TIME	ACCTME =		
2-07- CORNER SPD	CORSPD =		
2-10- RUNSPD LIMIT	RUNLMT =		
2-12- MIN ACCEL	MIN ACCEL =		
2-14- GAIN BREAK	GAIN BREAK =		
2-16- LOOP GAIN	LPGAIN =		
2-18- SLWDWN DIST	SLWDST =		
2-19- DISABL DIST	DISABL =		
2-29- SLWDWN RAD	SLWRAD =		
2-30- MIN RAD SPD	MRADSP =		
2-32- MIN SLW ANG	MINSLW =		
2-33- MAX SLW ANG	MAXSLW =		
2-45- DEFLT DWELL	DFDWEL =		
2-46- MIN OFF DWL	MINOFF =		
2-49- START DELAY	STRDLY =		

2.4 System Overlay Table #3 Parameters - SERV43

Continue with this process to access the data in Overlay Table #3 by pressing the hidden "SERVICE" button and access SERV43-TB 3 DATA. Press ENTER to display the overlay table #3 list.

2.4.1 SERV43 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
3-03- ACCEL TIME	ACCTME =		
3-07- CORNER SPD	CORSPD =		
3-10- RUNSPD LIMIT	RUNLMT =		
3-12- MIN ACCEL	MIN ACCEL =		
3-14- GAIN BREAK	GAIN BREAK =		
3-16- LOOP GAIN	LPGAIN =		
3-18- SLWDWN DIST	SLWDST =		
3-19- DISABL DIST	DISABL =		
3-29- SLWDWN RAD	SLWRAD =		
3-30- MIN RAD SPD	MRADSP =		
3-32- MIN SLW ANG	MINSLW =		
3-33- MAX SLW ANG	MAXSLW =		
3-45- DEFLT DWELL	DFDWEL =		
3-46- MIN OFF DWL	MINOFF =		
3-49- START DELAY	STRDLY =		

2.5 System Overlay Table #4 Parameters - SERV44

Continue with this process to access the data in Overlay Table #4 by pressing the hidden "SERVICE" button and access SERV44-TB 4 DATA. Press ENTER to display the overlay table #4 list.

2.5.1 SERV44 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
4-03- ACCEL TIME	ACCTME =		
4-07- CORNER SPD	CORSPD =		
4-10- RUNSPD LIMIT	RUNLMT =		
4-12- MIN ACCEL	MIN ACCEL =		
4-14- GAIN BREAK	GAIN BREAK =		
4-16- LOOP GAIN	LPGAIN =		
4-18- SLWDWN DIST	SLWDST =		
4-19- DISABL DIST	DISABL =		
4-29- SLWDWN RAD	SLWRAD =		
4-30- MIN RAD SPD	MRADSP =		
4-32- MIN SLW ANG	MINSLW =		
4-33- MAX SLW ANG	MAXSLW =		
4-45- DEFLT DWELL	DFDWEL =		
4-46- MIN OFF DWL	MINOFF =		
4-49- START DELAY	STRDLY =		

2.6 System Overlay Table #5 Parameters - SERV45

Continue with this process to access the data in Overlay Table #5 by pressing the hidden "SERVICE" button and access SERV45-TB 5 DATA. Press ENTER to display the overlay table #5 list.

2.6.1 SERV54 PARAMETERS

Parameter Number and Name	**PARAMETER VALUE. WRITE THE DISPLAYED VALUE IN THE SPACE PROVIDED IN THIS COLUMN**	**Default value to be used for older systems where a parameter was not part of the older products list.**	**Notes or special instructions for re-entering this parameter on the Burny 2.5 Plus system**
5-03- ACCEL TIME	ACCTME =		
5-07- CORNER SPD	CORSPD =		
5-10- RUNSPD LIMIT	RUNLMT =		
5-12- MIN ACCEL	MIN ACCEL =		
5-14- GAIN BREAK	GAIN BREAK =		
5-16- LOOP GAIN	LPGAIN =		
5-18- SLWDWN DIST	SLWDST =		
5-19- DISABL DIST	DISABL =		
5-29- SLWDWN RAD	SLWRAD =		
5-30- MIN RAD SPD	MRADSP =		
5-32- MIN SLW ANG	MINSLW =		
5-33- MAX SLW ANG	MAXSLW =		
5-45- DEFLT DWELL	DFDWEL =		
5-46- MIN OFF DWL	MINOFF =		
5-49- START DELAY	STRDLY =		

3. Retrieving Custom Aux Table Data – SERV78

The Burny 2.5 has the ability to convert the M and G or ESSI auxiliary functions in a part program into the functional codes needed by the Burny to cut the part. The data for making this conversion is contained in a list accessed by pressing the hidden "SERVICE" button, and then selecting the SERV78-CUSTOM AUX utility. Press ENTER to access the first entry in the list. There are 2 display formats used with this list—when the table is first accessed, the display will be in the "Table position" mode which shows which of the 50 possible entries is being displayed, and the current setting for that table location:

AUX01-M20-CUTOFF

This indicates that the first table location "AUX01" contains the data to convert an M20 code from a word address program into an internal Cut Off function—turn the oxygen or plasma off at the end of a cut.

Pressing ENTER at this point changes the display to show the TVVFF code for the AUX01 entry—the display will appear as:

32005-M20-CUTOFF

The 32005 is the TVVFF code:

T -- a single digit that defines the type of code begin converted (1-ESSI, 2-G code, 3-M code)

VV – a 2 or 3 digit value (up to 127) that defines the numeric value for the code (20 in this example)

FF – a 2 digit code defining the internal function assigned to the code (see Burny 2.5 manual for the list)

It is NOT necessary to understand what all these codes do to install the Burny 2.5 Plus processor card--- the important thing is to get them written down in the following chart so they can be re-entered in the new control.

The procedure would be to step through the list for each of the AUX entries and write down the data displayed for the block and the TVVFF displays.

While this list contains a maximum of 50 entries, the number of AUX table entries is usually much less. The end of the list is indicated by a display of a location being AVAILABLE. This means that no data has been entered for this table entry—the Burny will not search the table past this AVAILABLE location therefore any data following the first AVAILABLE location is not needed—it would not affect the controls operation in any way.

Begin stepping through the list and write down the data in the following chart:

3.1.1 AUX CODE TABLE DATA

Table location display: Example: AUX01 – M20 – CUT OFF	TVVFF display Example:32005 – M20 – CUT OFF
AUX01 -- --	-- --
AUX02 -- --	-- --
AUX03 -- --	-- --

AUX04	--	--	--	--
AUX05	--	--	--	--
AUX06	--	--	--	--
AUX07	--	--	--	--
AUX08	--	--	--	--
AUX09	--	--	--	--
AUX10	--	--	--	--
AUX11	--	--	--	--
AUX12	--	--	--	--
AUX13	--	--	--	--
AUX14	--	--	--	--
AUX15	--	--	--	--
AUX16	--	--	--	--
AUX17	--	--	--	--
AUX18	--	--		
AUX19	--	--		
AUX20	--	--		
AUX21	--	--		
AUX22	--	--		
AUX23	--	--		
AUX24	--	--		
AUX25	--	--		
AUX26	--	--		
AUX27	--	--		
AUX28	--	--		
AUX29	--	--		
AUX30	--	--		
AUX31	--	--		
AUX32	--	--	--	--
AUX33	--	--	--	--
AUX34	--	--	--	--
AUX35	--	--	--	--
AUX36	--	--	--	--

AUX37	--	--	--	--	
AUX38	--	--			
AUX39	--	--			
AUX40	--	--			
AUX41	--	--			
AUX42	--	--			
AUX43	--	--			
AUX44	--	--			
AUX45	--	--			
AUX46	--	--			
AUX47	--	--			
AUX48	--	--			
AUX49	--	--			
AUX50	--	--			

4. OPTION CODES

All of the Burny 2.5 and related Series 2 controls have various software options that are enabled by special "Lockout" codes based on the serial number of the control. While the new Burny 2.5 Plus card has all "options" now loaded as standard features, the Option Settings for the old board must be documented to determine some of the parameter settings on the new board.

There are two ways that this is done, depending on the age of the software in the existing control.

4.1 Option code display on very old systems.

Very old systems only display the options as a coded text string during power-up. The control will turn on and go through it's normal tests, and then display a text string as:

OPTN- C2D4007000

Each digit in this display references a particular option.

Turn the power Off, and back On to the control, and wait for this string to appear—then record the value in the following spaces (it may take several cycles of power Off/On to get the entire string written down correctly).

OPTN										

4.2 Option code display on newer Burny 2.5 (Series 2) systems

Controls with more recent software will have a display function called DSPY80 which tells the ON/OFF status of each option directly on the screen. Press the DSPY button and select DSPY80. When the ENTER button is pressed, the display will first show a sequence of values showing the serial number, hardware type and how much memory is used. Press the ENTER button during this sequence and the display will change to show:

OPTIONS

KERF --- ON or KERF --- OFF

Pressing enter will step down through this list and show the status of each option as ON or OFF. Record these values in the following chart for later use. Some of these options may not appear in the list since they are now considered "standard"—the chart has locations for them to make the recording process easier

4.2.1 Option ON/OFF status

OPTION NAME	ON/OFF
KERF	
SCALE	
ROTATE	
MIRROR	
PLATE ALIGN	
SERIAL COMM	
COMM ENHANCE	
CAD LINK	
PLATE MARKER	
STD. SHAPES	
TEACH	
KNIFE KERF	
CUSTOM AUX.	
LANGUAGE or individual language such as SPANISH, FRENCH, GERMAN, etc.	
FLOPPY DRIVE	
PRG. FDRT/KRF (programmable feedrate and kerf)	

5. BACKUP PART PROGRAMS

The final section of data that must be transferred from the existing Burny 2.5 to the new Burny 2.5 PLUS card are the stored part programs in the control. Part programs could have been created by either loading a Standard Shape, Template Teach, Downloading a program from the serial port or a Floppy, or creating a program using the Editor.

When the old processor card is removed from the system, these programs will be lost unless they are backed up to some external device. Some customers will already have all of their programs stored on the host computer, so there is no need to backup the data from the Burny 2.5. However, other customers will have programs created by template teach, that are only stored in the Burny 2.5's memory—these programs should be backed up if possible.

This can be done in two ways.

If the system is equipped with a serial port, and the external computing device can accept program uploads, use the STORE function in the Burny 2.5 to store to the RS-232 port and send all the internal programs up to the host computer.

If the system is equipped with an internal or external Floppy Disk drive, use the STORE function in the Burny 2.5 and store the programs to a series of floppy disks so they can be reloaded into the new card.

6. Power Off—Swap processor cards

Now that all the data from the existing Burny 2.5 processor card has either been stored to some external device, or recorded on this document on the lists provided, the old card can be removed, and the new card installed.

IMPORTANT: Remove all sources of AC power to the machine before performing any service work. The main power disconnect should be turned off and Locked in the OFF state to prevent someone from accidentally turning the power back on during the service operation.

WARNING: Proper handling procedures must be followed when installing the new MO-12438 Burny 2.5PLUS processor card. This card contains many high speed, high density electronic devices that can be damaged by STATIC ELECTRICITY caused by improper handling. Before removing the card from it's protective bag, the installing technician MUST use a grounded anti-static wrist strap connected to the machine chassis. All sources of STATIC ELECTRICITY should be removed from the area (any styrofoam, plastic packing material, bubble wrap, plastic paper sleeve protectors, etc). Once the board is removed from it's protective bag, it should be installed directly into the Burny system—do not lay it on a table or other surface that may not be grounded.

**The existing Burny 2.5 processor card should be placed back into the same protective anti-static bag after it is removed from the system. **

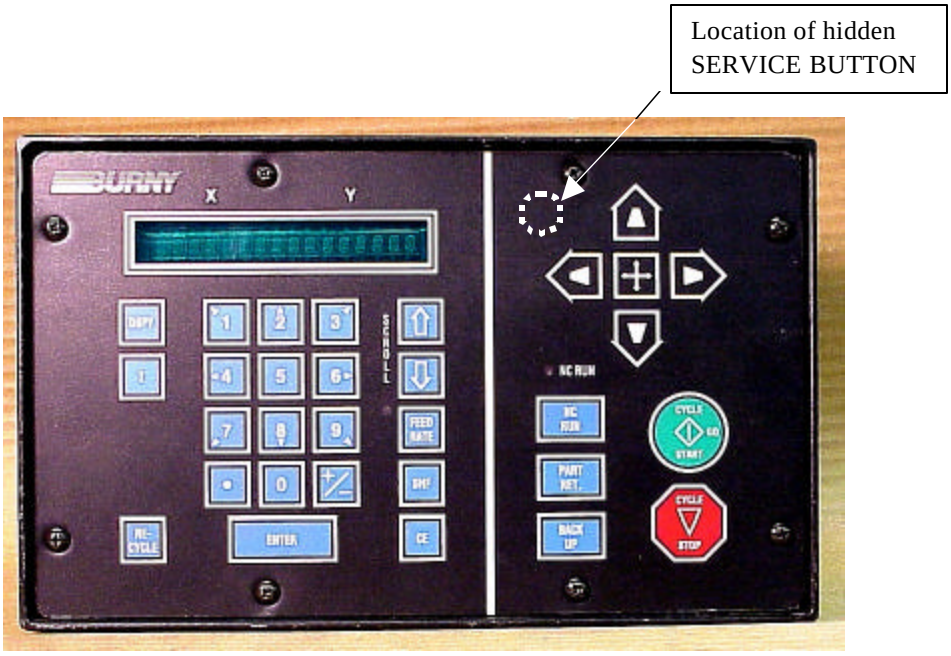


Figure 1- Typical Burny 2.5 Front Panel

Card installation:

1. Remove all sources of AC power to the machine, and lock-out the power disconnect to the machine to prevent accidental re-application of AC power during the service process.

2. Connect a grounded anti-static wrist strap to the machine frame and place it on the wrist of the installing technician.

3. Remove the screws holding the front panel of the product. For the Burny 2.5, these are the 8 screws around the keyboard panel. On the 1250 and 1400, there are 8 to 10 screws holding in the entire front hinged door. And finally, on the Burny 2.8, there are 22 screws holding the entire top cover of the cabinet—remove all but the bottom 4 screws along the lower front edge of the cabinet—just loosen the front 4 screws and lift the lid out of the slotted holes. See Figure 1.

4. Once the screws are removed, lay the front panel open so the screws holding the interface card to the processor card can be accessed.

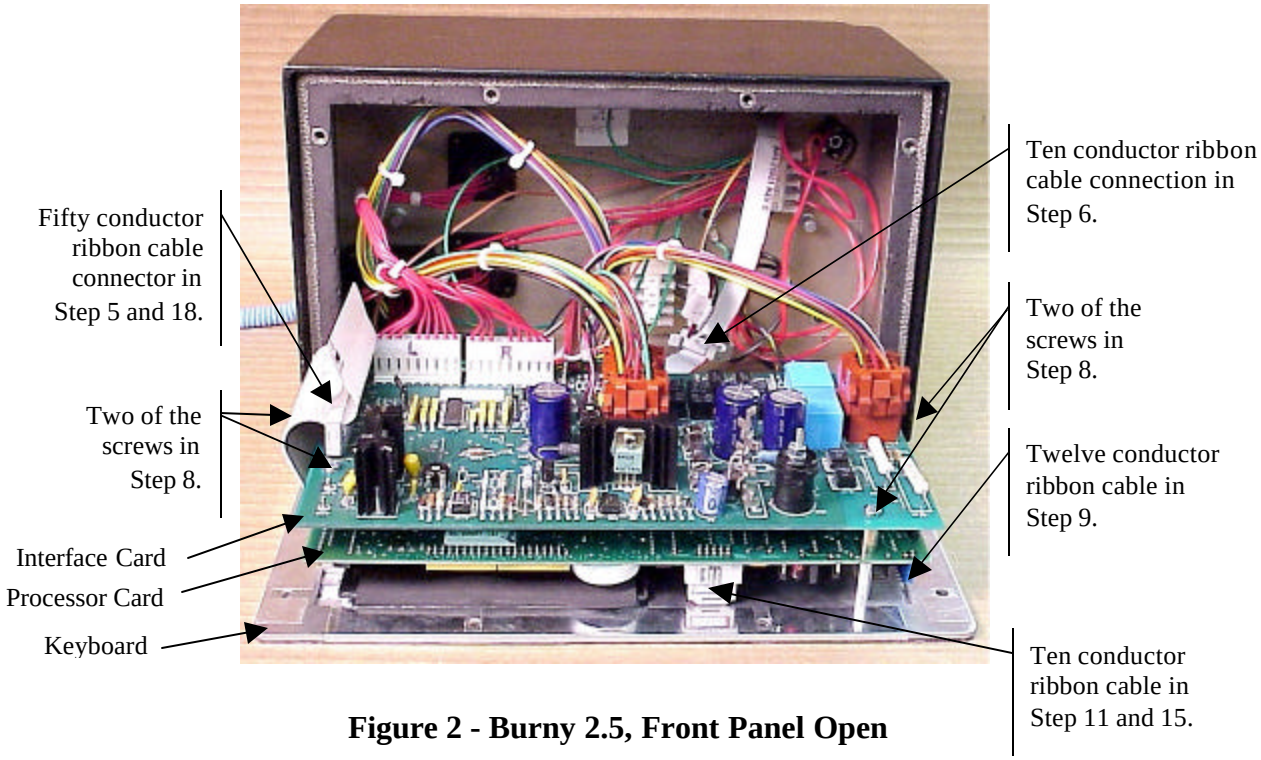


Figure 2 - Burny 2.5, Front Panel Open

5. Unplug the large 50 conductor ribbon cable that runs from the processor card to the interface card. See Figure 2.

6. Disconnect the 10 conductor ribbon cable from the processor card to the RS-232/422 modem. See Figure 2.

7. If installed, unplug the 14 conductor ribbon cable that runs from the processor card to the optional home limit switch input card used on some Burny 2.5 and 2.8 systems. See Figure 3.

8. Remove the 4 screws holding the interface card to the processor card in the system. This will make the interface and the processor card free floating so take care not to drop or stress the wires in the system during

this step. See Figure 2.

9. Lift the processor card slightly away from the keyboard panel, and unplug the 12 conductor ribbon that runs from the keyboard panel to the processor. See Figure 2.

10. Remove the old processor card from the system.

11. Remove the short 10 and/or 14 conductor ribbon cables from the old processor card—these will be re-used with the new card. See Figure 3.

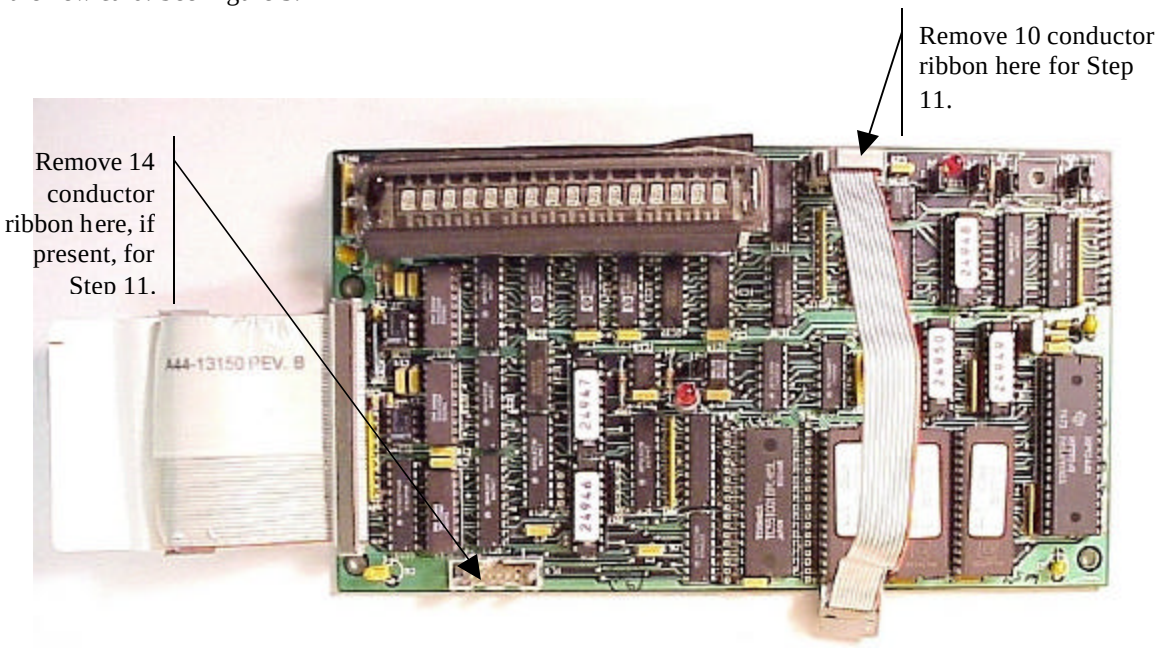


Figure 3 - Burny 2.5 Existing Processor Board

12. If a Burny 2.8 is being updated, remove the old keyboard by removing the 6 screws around the bezel on the front of the unit and discarding the old keyboard. Install the new keyboard supplied with the updated kit using the same screws and bezel as the old panel.

13. If a Burny 2.5 is being updated, discard the old keyboard. Use the new keyboard supplied with the update kit.

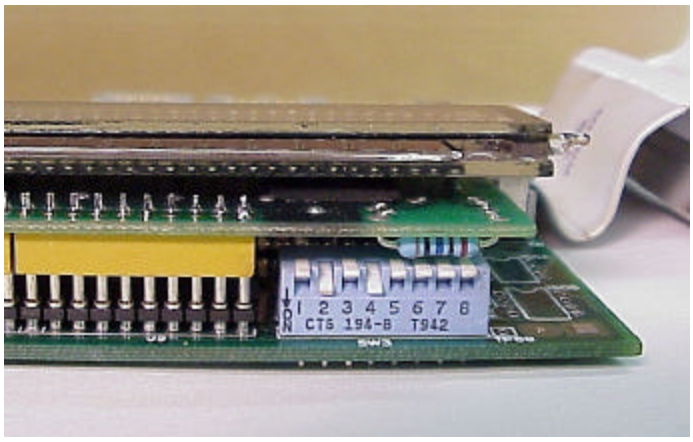


Figure 4 - DIP Switch in Step 14

14. Remove the new MO-12438 processor card from it's protective bag. See Figure 5 and 9. Set the DIP switch located on the new card under the readout as follows:

    - When using the MO-12438 card with any of the Burny 2.5 type keyboards that include the **4 DIRECTIONAL JOG ARROWS,** or with a **Burny 1250** or **Burny 1400** keyboard which also include the jog arrow buttons, the DIP switch on the MO-12438 **MUST** be set as follows:

      Position 1 -- OFF
      Position 2 -- ON
      Position 3 -- OFF
      Position 4 -- ON
      Position 5 -- OFF
      Position 6 -- OFF
      Position 7 -- OFF
      Position 8 -- OFF

      See Figure 4 -- these are the proper jumper settings when used with the new Burny 2.5 Plus front panel.

    - See APPENDIX A for details and precautions for using the MO-12438 card with older style Burny 2.5, 2.8 and private label keyboard panels.

15. Re-connect the 10 and/or 14 conductor ribbon cables to the new processor card—the connectors for these cables are located in almost the exact same location as the old card. Take care that the 10 pin cable for the serial RS-232/422 port is connected to the J4 connector on the new card. There is another 10 pin connector on the new processor card that will be used for software updates—but it will not function for the RS-232 port use. See Figure 5.

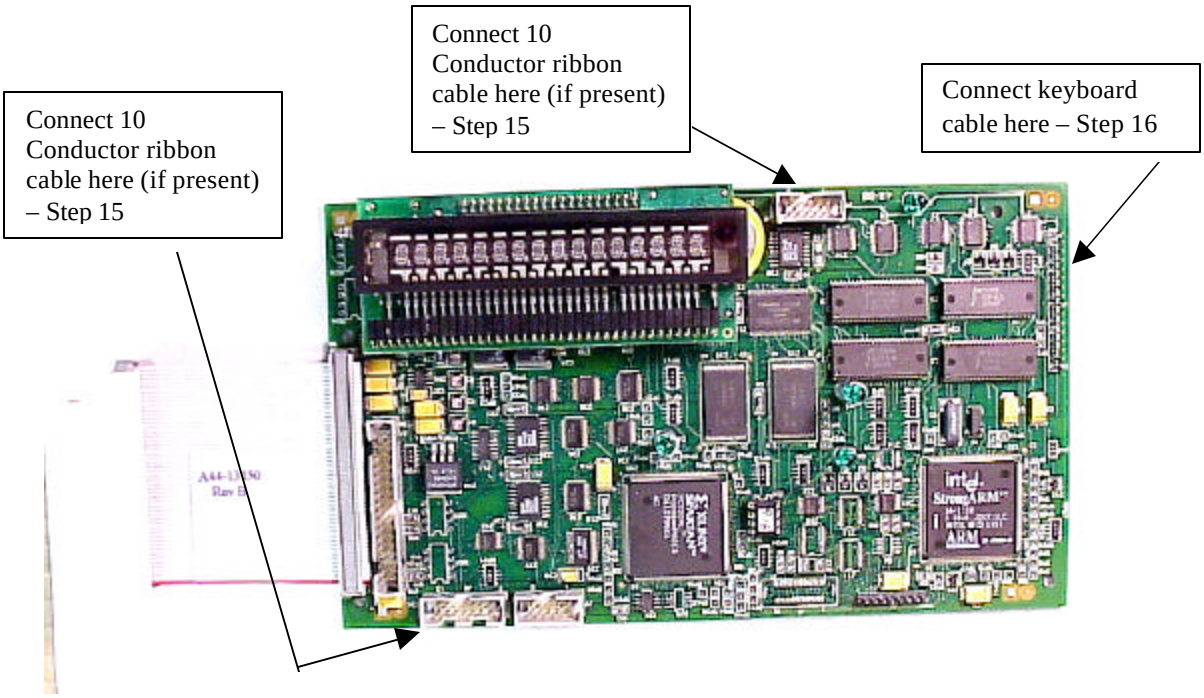


Figure 5 - Front of New Processor Board

16. Place the new MO-12438 card over the keyboard, and connect the ribbon from the keyboard to the J1 connector on the new processor card. Be sure to apply the ribbon connector starting at pin 1 of the J1 connector—the new processor card has some extra pins included in the J1 connector for future expansion—the older keyboards must be connected to the original 12 input pins. Also make sure the 10 or 14 conductor additional ribbon cables are routed under the card properly and are not pinched or interfering with the LED's or other devices.

17. Align the interface card and new processor over the keyboard standoffs, and replace the 4 screws to hold these two boards together.

18. Connect the 10, 14 and 50 conductor ribbon cables to their respective locations in the system. See Figure 2.

19. Replace the keyboard in the cabinet on 2.5 systems, close the door on the 1250/1400 or replace the 2.8's cabinet lid and replace the screws to hold in the panel or door. Make sure all screws are tight to insure a dust tight seal around the opening.

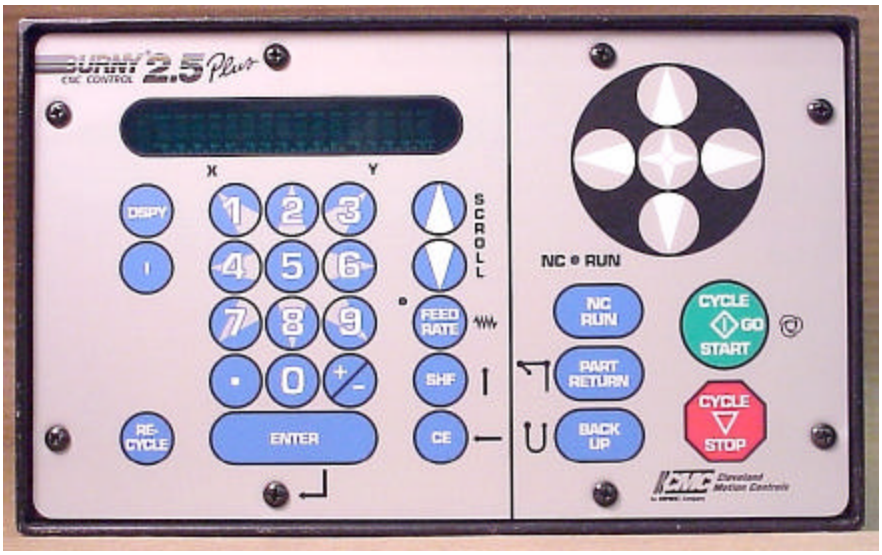


Figure 6 - Burny 2.5 *Plus* Front Panel

20. Remove the wrist strap now that the new card is installed and the cabinet is closed

21. Continue with this procedure to re-install all the data needed to make the new board function on the machine.

7. Power ON – Re-install saved data

Now that the mechanical installation of the new card is complete, the new card must be configured to run the system and act the same as the card that was removed. There will be some changes in the operation of the controls since you are updating the software to the most recent software version as a result of this card exchange. Consult the new Burny 2.5 operation manual supplied with the update kit for details on how to operate the new features.

1. Re-Apply AC power to the cutting machine and turn on the Burny system if there is a separate switch. The control should power up normally and display the familiar READY --- SELECT FUNCTION message.

2. DO NOT enable the servo drives for the system. If possible, disengage the pinion gears from the drive rack so that the machine. This is done as a precaution until it is confirmed that the parameters are working correctly in the new system.

3. Verify that the keyboard works properly. Try several operations to verify that most of the keys work correctly.

4. Press the hidden SERVICE button and select the SERV52- MEM RESET. Press ENTER and answer YES to both prompts to reset the program storage memory. After the process is done, use the DSPY80 function to display the amount of memory Used and Available. There should be almost 512K bytes available—this is the standard memory size on the MO-12438 Burny 2.5 Plus processor card.

5. Press the hidden SERVICE button and access the SERV10 parameter list. GO back to section 2.1.1 of this document and enter all the parameters in the SERV10 list. ALL PARAMETERS must be entered into the new card—do not skip any of the entries. If a value was not found in the old card, there is a suggested DEFAULT value in the table that should be entered into the new card. After the system is running, these new parameters may need to be re-adjusted to give optimal machine performance—see the new manual shipped with the update for details on the new parameter settings.

SPECIAL REQUIREMENTS FOR OLDER SYSTEMS

If the MO-12438 is being used to replace the older MO-03370, MO-4873, or MO-04875 processor cards—see APPENDIX B for information regarding the encoder scaling jumpers on these old cards, and how it affects the setup parameters

6. Refer back to Section 4 of this document where the OPTIONS from the old board were recorded. All of the features that used to be referred to as OPTIONS are now all STANDARD features in the Burny 2.5 Plus—there are no special option codes to enter. However, 2 of these old OPTION capabilities require a setting of one of the setup parameters to either ENABLE or DISABLE the feature.

COMM ENHANCE OPTION

Parameter SD51 now has a bit to control the COMM ENHANCE OPTION. This is an 8 digit parameter--for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the COMM ENHANCE option was ON with the old board, set digit D3 of the SD51 parameter to 0. (xx0xxxxx). This will cause the COMM ENHANCE to function on the new card.

- If the COMM ENHANCE option was OFF with the old board, set digit D3 of parameter SD51 to an "8" to disable the COMM ENHANCE feature on the new board— (xx8xxxxx).

KNIFE KERF OPTION

Parameter SD63 now has a bit to control the KNIFE KERF OPTION. Knife kerf is a special mode for the kerf routine that is used by the sign making industry for the special requirements of the drag knife used for cutting vinyl material, or for router cutting of plastic and aluminum for signs.

This is an 8 digit parameter-- for reference purposes, the digits are referred to as D1 to D8 from left to right—so the digits are numbered 12345678. Each digit controls several different functions, so only change the digit indicated below—you must re-enter the remaining digits as they were before.

- If the KNIFE KERF option was ON with the old board, set digit D3 of the SD63 parameter to a 1. (xx1xxxxx). This will cause the KNIFE KERF to function on the new card.

- If the KNIFE KERF option was OFF with the old board, set digit D3 of parameter SD51 to an "0" to disable the KNIFE KERF feature on the new board— (xx0xxxxx).

7. Press the hidden SERVICE button again, and access the SERV41 overlay table list. Go back to section 2.2.1 of this document and re-enter all the parameters saved from the SERV41 list in the old control.

8. Press the hidden SERVICE button again, and access the SERV42 overlay table list. Go back to section 2.3.1 of this document and re-enter all the parameters saved from the SERV42 list in the old control.

9. Press the hidden SERVICE button again, and access the SERV43 overlay table list. Go back to section 2.4.1 of this document and re-enter all the parameters saved from the SERV43 list in the old control.

10. Press the hidden SERVICE button again, and access the SERV44 overlay table list. Go back to section 2.5.1 of this document and re-enter all the parameters saved from the SERV44 list in the old control.

11. Press the hidden SERVICE button again, and access the SERV45 overlay table list. Go back to section 2.6.1 of this document and re-enter all the parameters saved from the SERV45 list in the old control.

12. Press the hidden SERVICE button and perform the SERV97 procedure to store the new parameters so they will not be lost when the power is turned off.

13. Press the hidden SERVICE button and select the SERV51-SPD CAL function—press ENTER to select the function, but DO NOT follow the prompts on the screen regarding the CYCLE START button. Instead, press the hidden SERVICE button again, and now select the SERV97 function and store the cleared speed calibration data.

14. Press the hidden SERVICE button and access the SERV78-CUSTOM AUX code conversion table. Go back to section 3.1.1 and re-enter all the data saved for the Custom AUX table from the old control. The procedure would be to press the ENTER button to get to the next AUX location, then press ENTER again to access the TVVFF entry screen. Enter the TVVFF code saved from the old control (32005) and press ENTER. You can scroll back to a previous entry to check it if desired.

15. The control should now be operational. Turn on the servo drives and test the motion of the machine. See the manual that came with this update kit for details on the new setup parameters for help in adjusting the machine's performance.

8. Appendix A – DIP Switch settings for older Burny 2.5 Front Panels

Older front panels for the Burny 2.5, as well as several of the private labeled versions did not include the 4 Directional JOG ARROWS as shown in the pictures. These panels used a sequence of pressing the II button, then used the numbered keyboard to select the jog direction.

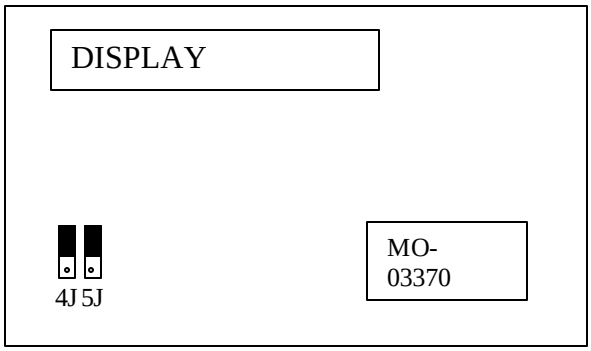
To configure the new MO-12438 board to work correctly with these older panels, the DIP switches must be set to match the configuration jumpers from the old boards.

DIP switch settings for MO-03370 processor card replacement

SW1 – ON
SW2 – OFF
SW3 – OFF
SW4 – Set to ON if Jumper 4J is set AWAY from the display.
Set to OFF if Jumper 4J is set TOWARD the display.

SW5 – Set to ON if Jumper 5J is set AWAY from the display.
Set to OFF if Jumper 5J is set TOWARD the display.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-04873 or MO-04875 processor card replacement

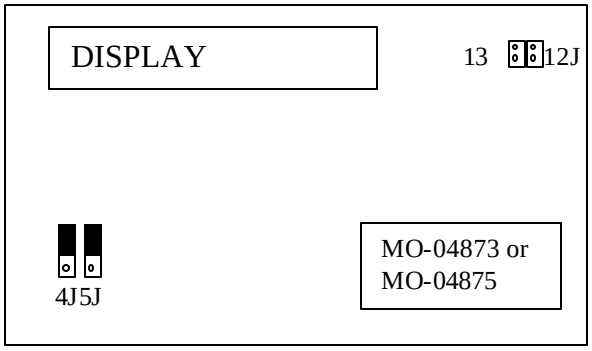
SW1 – ON
SW2 – Set to OFF if Jumper 12J is missing,
Set to ON if jumper J12 is installed

SW3 – Set to OFF if Jumper 13J is missing,
Set to ON if jumper J13 is installed

SW4 – Set to ON if Jumper 4J is set AWAY from the readout.
Set to OFF if Jumper 4J is set TOWARD the readout.

SW5 – Set to ON if Jumper 5J is set AWAY from the readout.
Set to OFF if Jumper 5J is set TOWARD the readout.

SW6, SW7, SW8 – All set to OFF



DIP switch settings for MO-08601 or MO-11249 processor card replacement

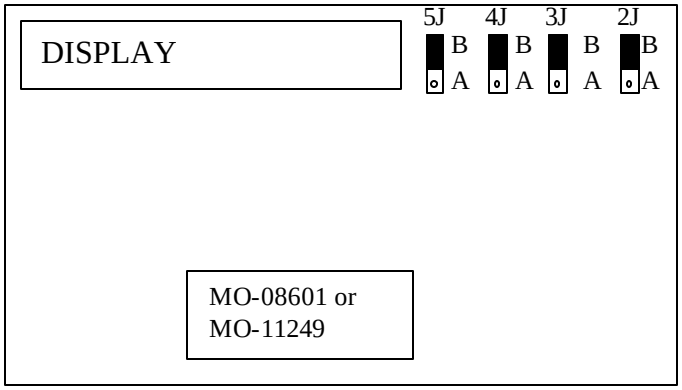
SW1 – ON
SW2– Set to OFF if Jumper J2 is set to “A”,
Set to ON if Jumper J2 is set to “B”

SW3– Set to OFF if Jumper J3 is set to “A”,
Set to ON if Jumper J3 is set to “B”

SW4– Set to OFF if Jumper J4 is set to “A”,
Set to ON if Jumper J4 is set to “B”

SW5– Set to OFF if Jumper J5 is set to “A”,
Set to ON if Jumper J5 is set to “B”

SW6, SW7, SW8 – All set to OFF



9. Appendix B – Changes to Encoder Scaling for older 2.5 updates

The older MO-03370, MO-04873 and MO-04875 processor cards included hardware jumpers J6 thru J9 on the card. These were used to tolerate faster encoder counting frequencies that could not be handled by the hardware. The newer 2.5 processor cards use faster encoder counting circuitry and eliminated these jumpers.

If one of these older boards (3370,4873,4875) are being replaced, the setting of these jumpers can affect the parameters entered into the new MO-12438 card.

If all 4 of the jumpers J6,J7,J8 and J9 are set toward the display (See Fig. 1), then the setup parameters from the old board can be directly entered into the new card.

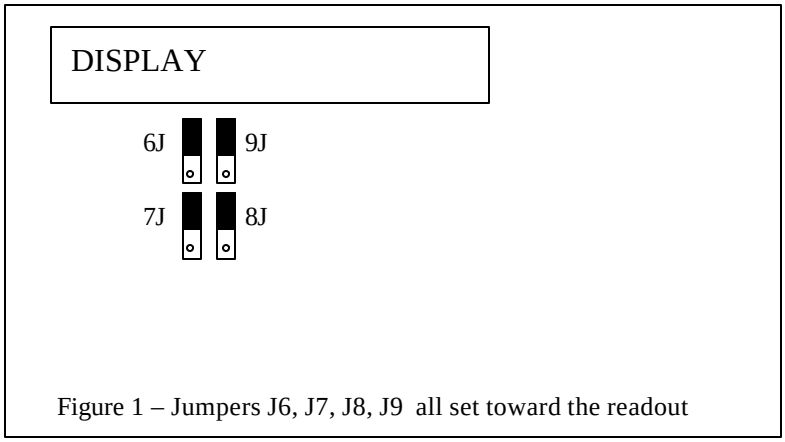


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

Some installations may be using faster encoders, particularly motor mounted encoders, and may have these jumpers set the opposite direction. If all 4 of the jumpers J6,J7, J8, J9 (Figure 2) are set away from the DISPLAY, then the value recorded for parameter SD22- ENC LINES/REV must be multiplied by 4. So for example, a system where the old card had a setting of 500 for SD22 would need to have 2000 entered into the new MO-12438 to work properly.

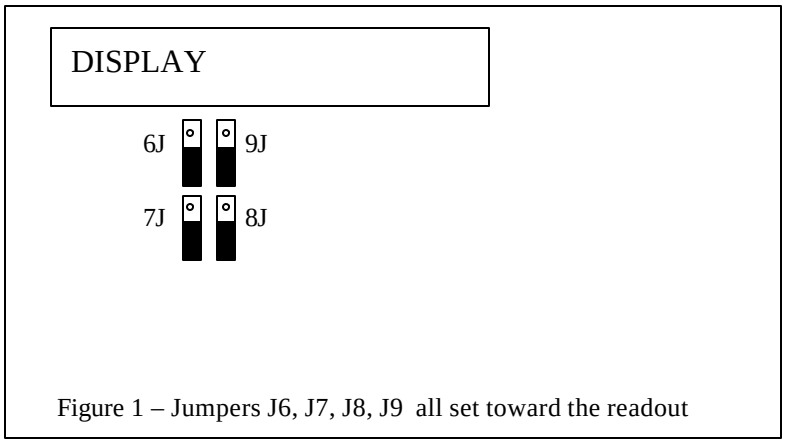


Figure 1 – Jumpers J6, J7, J8, J9 all set toward the readout

If the old system has jumpers J6, J7, J8, J9 set to any other random pattern, contact the factory since this will require modifying several of the system parameters. This is very uncommon.

10. Appendix C "Burny 2.5 Plus-- New features and Capabilities"

The goal of the 2.5 Plus development program was to produce a new version of the computer board in the Burny 2.5 series products that would improve the speed and system performance, without affecting the basic operation. The 2.5 Plus processor card will perform RS-232 downloads, and the Kerf calculations 80-90% faster than the older cards.

Most of the prompting, displays and operator inputs are exactly the same as the older cards—so there is little or no re-training required when the new 2.5 Plus card is substituted for an older card. However, there is the problem that the 2.5 Plus basically copies the operation of the Burny 2.5 software that was in existence at the end of 1999. If the older 2.5 card had software dating back many years (could go back as far as 1988), then there will be substantial differences in the machine's operation due to the changes and improvements that have occurred over the years of software development on the Burny 2.5 product line. This may require some additional training for the operators to become familiar with the new operation of the control, and the new capabilities available to the operator. See the new OPERATION MANUAL supplied along with this Burny 2.5 Plus product for details on all the current features of the product.

The two main areas where a difference will be noted are in the Serial I/O downloading speeds, and the Kerf processing speed.

Kerf Processing speed

The Kerf process is self contained within the Burny 2.5 Plus—there is no interaction with the outside world so the process can function at peak efficiency.

Serial I/O Downloading Speed

The Serial I/O downloading is a different matter. Since the Serial I/O communication via the RS-232/422 port connects to devices outside the Burny product, the performance of the downloading system is very dependent on the performance and setting of the external devices. For example, if the existing cutting machine had the BAUD rate set to 2400 Baud for the serial downloading speed, there will be NO increase in performance of the Serial Downloading speed with the Burny 2.5 Plus—the older card work just as well at 2400 baud as the new 2.5 Plus card. To fully take advantage of the new downloading speed capacity of the Burny 2.5 Plus card, the external system must be capable of supplying the data faster also. The following is an ESTIMATE of the speed improvement expected for various Baud rate settings of the Burny 2.5 Plus. Note that the higher baud rate settings were not even possible with the older Burny 2.5 which was normally used up to about 4800 baud.

Serial I/O Downloading Baud Rate setting	ESTIMATED speed improvement with Burny 2.5 Plus.
300 to 2400 Baud	0%-- Same speed as older card
4800 Baud	25% Less time for download
9600 Baud	60% Less time for download
19.2K Baud	80% Less time for download
28.8K Baud	80% Less time for download
38.4K Baud	75% Less time for download
57.6K to 230K Baud	60-75% Less time—note that these very high baud rates require more system overhead and are actually LESS EFFICIENT than the somewhat slower settings from 19.2K to 38.4K Baud

Serial Number and Option codes

The Burny 2.5 Plus software does not use Option codes—all possible features for the product are available as Standard capabilities with every system that ships. Similarly, there is no longer a SERIAL NUMBER imbedded into the product—the display will show " SERIAL 0" for all Burny 2.5 Plus products. The main purpose for the Serial number was to control the software lockout codes for the options—no more options means no more serial number.

The fact that all Options are now standard will cause some new menus and displays to show up on older controls where a particular option was missing before. For example, if an older Burny 2.8 did not have the STANDARD SHAPES option installed, there would not have been a menu choice for "LOAD-STANDARD SHAPE" in the select function list. When the 2.5 Plus card is installed, the operator will now see this "LOAD- STANDARD SHAPE" prompt – this should be explained to the operator ahead of time to avoid possible confusion.

The following is a list of the features that will now appear on all controls—the ones marked ** may have been missing from the older card—they are now provided as a standard capability of the new Burny 2.5 Plus software:

- RUN- PROGRAM
- LOAD- FROM STD SHAPE ** (Older card required Standard Shape option to be enabled)
- LOAD- FROM RS-232 ** (Older card required Serial I/O Option to be enabled)
- STORE- TO RS-232 ** (Older card required Serial I/O Option to be enabled)
- TEACH- PROGRAM ** (Older card required Teach Option to be enabled)
- DELETE-PROGRAM
- EDIT-PROGRAM ** (Very old cards could only access EDIT via DSPY20-)
- LOAD- FROM FLOPPY ** (Older cards required Floppy option to be enabled)
- STORE- TO FLOPPY ** (Older cards required Floppy option to be enabled)
- LOAD/RUN- RS-232 ** (Older cards required Serial I/O option to be enabled)
- LOAD/RUN-FLOPPY ** (Older cards required Floppy option to be enabled)

Some operators may complain that they have to Scroll through too many choices in this new expanded list of features to get what they want. Remember that these choices can be made with a single button push as described in the operation manual— as a reminder, the following number keys select the indicted function:

- RUN- PROGRAM -- Press the number 1 on the keypad
- LOAD- FROM STD SHAPE -- Press the number 2 on the keypad
- LOAD- FROM RS-232 -- Press the number 3 on the keypad
- STORE- TO RS-232 -- Press the number 4 on the keypad
- TEACH- PROGRAM -- Press the number 5 on the keypad
- DELETE-PROGRAM -- Press the number 6 on the keypad
- EDIT-PROGRAM -- Press the number 7 on the keypad
- LOAD- FROM FLOPPY -- Press the number +/- on the keypad
- STORE- TO FLOPPY -- Press the number . (decimal point) on the keypad
- LOAD/RUN- RS-232 -- Press the number 3, then the SHF on the keypad
- LOAD/RUN-FLOPPY -- Press the +/- key, then the SHF on the keypad

Blank