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## Section 6: Formats

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### Formats

From the SETP Command the control has the option to use either:

**FORMAT 1** Format 1 is FADAL style programming and machine operation. Format 1 has been uniquely designed to have the CNC control reset before restarting machine operation. When the CNC control is in Format 1 the programmer may program with the minimal of commands. This helps as an aide to the user for programming, setup and operation. Some codes are unique for FORMAT 1 and

FORMAT 2. Listed in this chapter is the Examples for each formats programming style.

**FORMAT 2** Format 2 allows a 6M/ 10M /11M style programming and machine operation.

Format 2 follows the design to allow the programmer to completely command the CNC control. All resets therefore must be done by the programmer in the program and machine operation. Some codes are unique for FORMAT 2 and FORMAT 1. Listed in this chapter are the Examples for each formats programming style.



**WARNING:** When the control is in FORMAT 2, it is mandatory to program all preparatory codes!

The SETP command is usually used by the factory and by the setup person who installs the machine. It can also be used by the end user to establish programming, baud rate, and output preferences.

**Note:** The factory set parameters can be found on the inside of the pendant door.

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**Changing  
Parameters**

- 1) From the command mode type SETP then press the ENTER button.
- 2) The menu prompt at the bottom of the screen defines the use of the keyboard to move the cursor to the parameter to change. When the parameter to change has the cursor to its left, the parameter choices will be displayed at the bottom of the screen.
- 3) Select the parameter choice by pressing the number corresponding to the choice and press the ENTER button. The parameter will display the change and the cursor will move to the right.
- 4) Press the MANUAL button to exit and save the parameter setting mode.

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**Saving Parameters**

The PU,4 command is used to output the machine parameter list through the RS-232 port.

To output parameter information:

- 1) Get a computer ready to receive information through the RS-232 port.
- 2) Type the PU,4 command then press the ENTER button.

To receive parameter information:

- 1) Type the TA,1 command and press the ENTER button.
- 2) Send the file the parameter information was saved under to the machine.
- 3) The parameters are saved in a file that uses the SP command for parameter data.

## FORMAT 1 Parameter Settings

The following series of screens represent those displayed upon entering the SETP command. The parameters FORMAT, DEFAULT: G0, DEFAULT: G90, IMM. FIXED CYCLE: and CRC MODE: should be set as shown. All other parameters should be set as they are from the factory (See Figure 6-1A, 6-1B, and 6-1C).

```

                                     PAGE 1 OF 3
*FORMAT: 1      BAUD RATE: 2400      SPINDLE AFTER M6: NO
AXES: X,Y,Z     TRAVEL: X40 Y20 Z20  PENDANT: MOUNTED
DEFAULT: G0
DEFAULT: G90
DEFAULT: G17    TOOL CHANGER CAP: 21 IMM. FIXED CYCLE: NO
RPM FACTOR: 5  SPINDLE TYPE: 10,000 ORIENTATION FACTR: 10

THERE ARE TWO PROGRAM OPERATION FORMATS AVAILABLE
DO YOU WANT MAXIMUM GMB/10M/11M COMPATIBILITY?
* 1) NO, ORIGINAL FADAL STYLE - FORMAT 1
  2) YES, FORMAT 2

P-PAGE ENTER-RT BACKSP-LT U-UP D-DN MAN-EXIT OR SELECT NUM. <
    
```

**Figure 6-1 A**

```

                                     PAGE 2 OF 3
*DEFAULT: INCH  M8=FLOOD M7=MIST    3 PHASE > 5% LOW: NO
PU FORMAT: FILE
CRC MODE: M96   BINARY BUFFERS: 255 HI TORQUE/RIGID: NO
SPINDLE OFF: NO TURRET FACTOR: 1    CMD MENU: SPACE
PALLET: NO     GAIN: 100             RAMP: 100
ASPECT: 65     TIMERS: OFF           OVERLOAD: 2

ENTER THE DEFAULT VALUE
* 1) INCH
  2) METRIC

P-PAGE ENTER-RT BACKSP-LT U-UP D-DN MAN-EXIT OR SELECT NUM. <
    
```

**Figure 6-1 B**

```

PAGE 3 OF 3
*SCREW: #2      IPM: 400      XYZ RAMP: 160
Z TAP GAIN: HI  VECTOR: NO    AXIS DISPLAY: LOAD
AUTO BRAKE: YES A-PALLET: A-AXIS  B-PALLET: B-AXIS
5 AXIS HEAD: NO G0 DETAIL: 21  FEEDBACK: YES

SELECT THE SCREW PITCH TYPE?
1) INCH PITCH
* 2) 8/10 MILLIMETER PITCH

P-PAGE ENTER-RT BACKSP-LT U-UP D-DN MAN-EXIT OR SELECT NUM. <
    
```

**Figure 6-1 C**

**FORMAT 2  
Parameter Settings**

The following series of screens, shown in Figures 6-2A, 6-2B, and 6-2C, represent those displayed upon entering the SETP command. The parameters FORMAT:, DEFAULT: G1, DEFAULT: G91 N-WORDS ORDERED:, TOOL TABLE: and CRC MODE: should be set as shown. All other parameters should be set as they are from the factory.

```

PAGE 1 OF 3
FORMAT: 2      *BAUD RATE: 2400  SPINDLE AFTER M6: NO
AXES: X,Y,Z    TRAVEL: X40 Y20 Z20  PENDANT: MOUNTED
DEFAULT: G1
DEFAULT: G91
DEFAULT: G17   TOOL CHANGER CAP: 21
RPM FACTOR: 5 SPINDLE TYPE: 10,000 ORIENTATION FACTR: 10

ENTER DEFAULT BAUD RATE (THE RATE AFTER POWER-ON)
1) 110          5) 1200          9) 19200
2) 150          * 6) 2400          10) 38400
3) 300          7) 4800
4) 600          8) 9600

P-PAGE ENTER-RT BACKSP-LT U-UP D-DN MAN-EXIT OR SELECT NUM. <
    
```

**Figure 6-2 A**

```

                                     PAGE 2 OF 3
*DEFAULT: INCH  M8=FLOOD  M7=MIST  3 PHASE > 5% LOW: NO
PU FORMAT: FILE  N-WORDS ORDERED: YES  TOOL TABLE: DIAMETER
CRC MODE: M96   BINARY BUFFERS: 255   HI TORQUE/RIGID: NO
SPINDLE OFF: NO  TURRET FACTOR: 1     CMD MENU: SPACE
PALLET: NO      GAIN: 100              RAMP: 100
ASPECT: 65     TIMERS: OFF             OVERLOAD: 2

ENTER THE DEFAULT VALUE
* 1) INCH
  2) METRIC

P-PAGE ENTER-RT BACKSP-LT U-UP D-DN MAN-EXIT OR SELECT NUM. <

```

**Figure 6-2 B**

```

                                     PAGE 3 OF 3
*SCREW: #2      IPM: 400              XYZ RAMP: 160
Z TAP GAIN: HI  VECTOR: NO           AXIS DISPLAY: LOAD
AUTO BRAKE: YES A-PALLET: A-AXIS     B-PALLET: B-AXIS
5 AXIS HEAD: NO G0 DETAIL: 21        FEEDBACK: YES

SELECT THE SCREW PITCH TYPE?
  1) INCH PITCH
* 2) 8/10 MILLIMETER PITCH

P-PAGE ENTER-RT BACKSP-LT U-UP D-DN MAN-EXIT OR SELECT NUM. <

```

**Figure 6-2 C**

## FORMAT 1 Program Example #1

```

O1
M6 T1(.....TOOL #1 ID)
G0 G90 S##### M3 E## X###.#### Y###.####
H# M8 Z###.####
G4 P1000
[ Math work ]

```

G91 X##.#### L9 — the L9 repeats this line nine times

M5 M9

G0 G90 G80

Z0 G53

M6 T2(.....TOOL #2 ID)

G90 G0 S##### M3 E## X###.#### Y###.####

H# M8 Z###.####

G4 P1000

[ Math work ]

M5 M9

G0 G90 G80

Z0 G53

E0 X0 Y0

M2

---

**FORMAT 1 Program  
Example #2**

O1

(SUBROUTINE SECTION)

L100 (SUB #1 FOR \_\_\_\_\_ ) — each sub begins with an

L word, a sub number (1-99), and a two digit zero repetition (00).

M17

L200 (SUB #2 FOR \_\_\_\_\_ )

[ Math work ]

M17

L300 (SUB #3 FOR \_\_\_\_\_ )

[ Math work ]

M17 — this M17 marks the end of the last sub

M30 — the M30 marks the end of the program's sub section

( MAIN PROGRAM )

M6 T1(.....TOOL #1 ID)

G0 G90 S##### M3 E## X###.#### Y###.####

H# M8 Z###.####

G4 P1000

[Math work ]

L101 — this line calls sub #1 one time

M98 P5 L1 — this line calls subprogram 5 one time

L215 — this line calls sub #2 fifteen times

G91 X###.#### L9 — the L9 repeats this line nine times

M5 M9

G0 G90 G80

Z0 G53

M6 T2(.....TOOL #2 ID)

G90 G0 S##### M3 E## X###.#### Y###.####

H# M8 Z###.####

G4 P1000

[ Math work ]

M5 M9

G0 G90 G80

Z0 G53

E0 X0 Y0

M2

O5 (SUBPROGRAM #5 FOR \_\_\_\_\_ )

[ Math work ]

M99 — ending this program with an M99 makes it a subprogram.

---

**Notes on FORMAT 1  
Style Programming:**

- 1) Each line requires a sequence number and will be generated by the CNC control. Sequence numbers use an N####.### word. Decimal points can be used to input lines between existing line numbers. The sequence numbers can be added when the program is typed at the computer, but the numbers are added automatically when the program is transferred to the control with the TA (tape input) command. So it is possible to type the program without line numbers and have the control add the line numbers automatically. The NU command is used to renumber the lines.
- 2) Decimals are required for all dimensions, feed rates, and angles.

**EXAMPLE:** X Y Z ###.#### (or ##.##### for higher precision)

F ####.##

A ####.###

B ####.###

The decimal point does not appear with dimensions, feed rates, or angles, the control will add them. For Example if an X1 is entered it is accepted as X.0001 (See also DECIMALS and SIGNS).

- 3) The O word on the first line is not required. The O word is used only for identification of the program in the program library for multiple program storage. The first sixteen characters of the comment with the O word will



appear when the program library directory is displayed. This comment can be longer than sixteen characters but the remainder of the comment will only appear when the program is listed or printed. (See also the section on program library, the PR command.)

- 4) If the word NOEDIT is used within the first sixteen characters of the comment on the line with the O word, the program cannot be edit. The is the same function as using the KEY lock on the pendant.

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### FORMAT 2 Program Example

O# ( COMMENT )

( COMMENT )

G0 G17 G40 G70 G80 G90 H0 Z0

E0 X0 Y0 — this moves to the SETH position or cold start.

G92 X##.#### Y##.#### (or G54 X# Y# or E1 X# Y#)

M6 T1

(.....TOOL #1 ID)

G0 G90 S##### M3 X###.#### Y###.####

H# M8 Z###.#### D#

G4 P1000

[ Math work ]

M98 P4 L4 — this calls subprogram #4 four times

M98 P3 L27 — this calls subprogram #3 twenty seven times

G91 X##.#### G90 L9 — the L9 repeats this line nine times

M5 M9

G0 G90 H0 Z0

M6 T2

(.....TOOL #2 ID)

G0 G90 S##### M3 X###.#### Y###.#### E## (or G54-G59)

H# M8 Z###.#### D#

G4 P1000

[ Math work ]

M5 M9

G0 G90 H0 Z0

E0 X0 Y0 — use this line to cancel all fixture offsets

M30

O3 (SUBPROGRAM #3 FOR \_\_\_\_\_ )

[ Math work ]

M99... ending this program with an M99 makes it a subprogram.

It is called with an M98 P3 L#. The L word is used for number of repeats.

O4 (SUBPROGRAM #4 FOR \_\_\_\_\_ )

[ Math work ]

M98 P3 L1 — sub #4 is calling sub #3 one time (nesting)

M99 — ending this program with an M99 makes it a subprogram.

It is called with an M98 P4 L#. The L word is used for number of repeats.

---

**Notes on FORMAT 2  
Style Programming:**

- 1) The safe block is mandatory at the beginning of the program. This is also known as a preparatory code line.

O# ( COMMENT

( COMMENT

Z0 G53

G0 G17 G40 G70 G80 G90 H0 E0 Z0

G28 X0 Y0 Z0 (A0 B0 if needed

- 2) The G28, with the axis designated to move, will bring the machine to the zero position established by the cold start command (CS) or to the zero position established by the SETX, SETY, SETZ, or SETH commands and/or Fixture offsets, whichever was used last. The SET commands can be used to establish a zero position at any desired location. The program does not need to start from the machine home position. See also the section on establishing home position.
- 3) Fixed subroutines such as bolt hole pattern subroutines or pocket cutting routines, from other machines cannot be used on this control. See the users manual for information on using fixed subroutines from the CNC 88 control.
- 4) The SETP command allows certain changes to default codes, diameter or radius input, and M7 M8 preferences.
- 5) When typing any variable (R0,R1 - R9) always type the positive or negative symbol before the value. R1+.5 R2+2.34 R3+5.7124 R4-6.765. See VMC User's Manual Subroutines section for proper usage.
- 6) The H word will only pick up the tool length offset. The D word must be used to pick up the diameter or radius from the tool table.
- 7) Tool changes can be made from any XY position. The M6 code change will move the head to the tool position and make the exchange. The T word and the M6 can appear together, M6T# or T# M6, and usually do with this type of tool changer; however, they may appear on separate lines.
- 8) Each line requires a sequence number. Sequence numbers use an N####.### word. Decimal points can be used to input lines between existing line numbers. The sequence numbers can be added when the program is typed at the computer, but the numbers are added automatically when the program is transferred to the control with the TA (tape input) command. So

it is possible to type the program without line numbers and have the control add the line numbers automatically. The NU command is used to renumber the lines.

- 9) Decimals are required for all dimensions, feed rates, and angles.

**EXAMPLE:** X Y Z ###.#### (or ##.##### for higher precision)

F ####.##

A ####.###

B ####.###

If decimals do not appear with dimensions, feed rates, or angles, the control will add them. For Example if an X1 is entered it is accepted as X.0001

- 10) The O word on the first line is not required. The O word is used only for identification of the program in the program library for multiple program storage. The first sixteen characters of the comment with the O word will appear when the program library directory is displayed. This comment can be longer than sixteen characters but the remainder of the comment will only appear when the program is listed or printed. (See also the section on program library, the PR command)

- 11) If the word NOEDIT is used within the first sixteen characters of the comment on the line with the O word, the program cannot be edited. This is the same function as using the key lock on the pendant.

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### Viewing the Software ID Number

Each software version has an ID number. Each time the software is updated write the new ID number in a convenient location. This number will be requested for some service or programming calls.

The ID number is located on the last page of the MENU DIRECTORY.

- 1) From the command mode type MU (for the menu mode) then press the ENTER button.
- 2) Look at the first page of the menu. The page numbers of each command will be displayed on the screen.
- 3) Find the last page number displayed in the MENU DIRECTORY

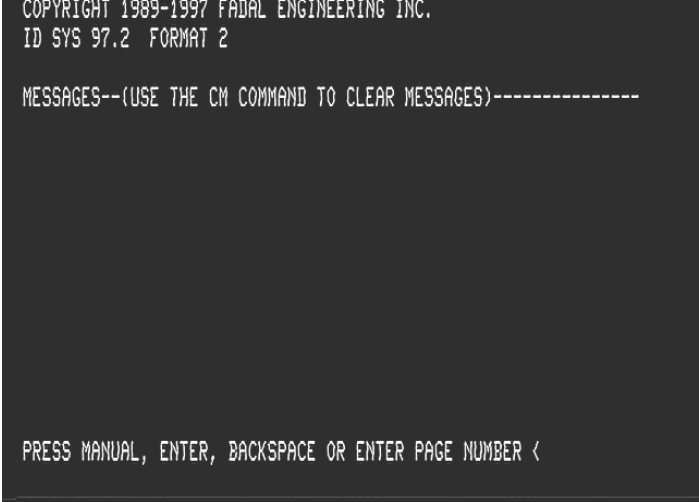
**EXAMPLE:** ERROR NUMBERS 40-42

MESSAGES 43

4) Type the page number then press the ENTER button.

**EXAMPLE:** 43 from the Example above

5) The *ID* number will now be displayed in the upper left corner of the screen.



**Figure 6-3** The software ID number is displayed in the upper lefthand corner of the display.

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