

QUICK TOUR OF THE FANUC SIMULATOR

Welcome!

The FANUC Simulator provides a safe environment for which to learn how to operate a FANUC CNC. If you can perform a task with the FANUC Simulator, you will then be able to perform the task on an actual FANUC CNC that is connected to a CNC machine.

After introducing you to its main components, we will provide you with several hands-on procedures aimed at getting you familiar with several common CNC tasks.

Here are some important points.

- ▲ Two machine types are supported
 - ▲ Machining center (mill) – this configuration is used for the quick tour.
 - ▲ To select the machining center configuration, hold the CTRL and M keys while press the ON button. Hold CTRL-M until you see the message that Manual Guidei is loading.
 - ▲ Turning center (lathe)
 - ▲ To select the turning center configuration, hold the CTRL and T keys while press the ON button. Hold CTRL-T until you see the message that Manual Guidei is loading
 - ▲ Data (programs and offsets, for instance) will be saved while using one configuration or the other, even after power off, but data will be lost when you switch machine configurations.
 - ▲ Again, be sure the machining center configuration is selected before continuing with this quick tour.
- ▲ Example program must be downloaded
 - ▲ During this quick tour, you will load, run, graph, and delete a practice program. The program is named Program.nc, and can be downloaded from www.cncci.com/Practice.nc.
 - ▲ Place this program in the root folder of a USB memory stick now to be ready for the upcoming program-manipulation procedures.

HYTECH

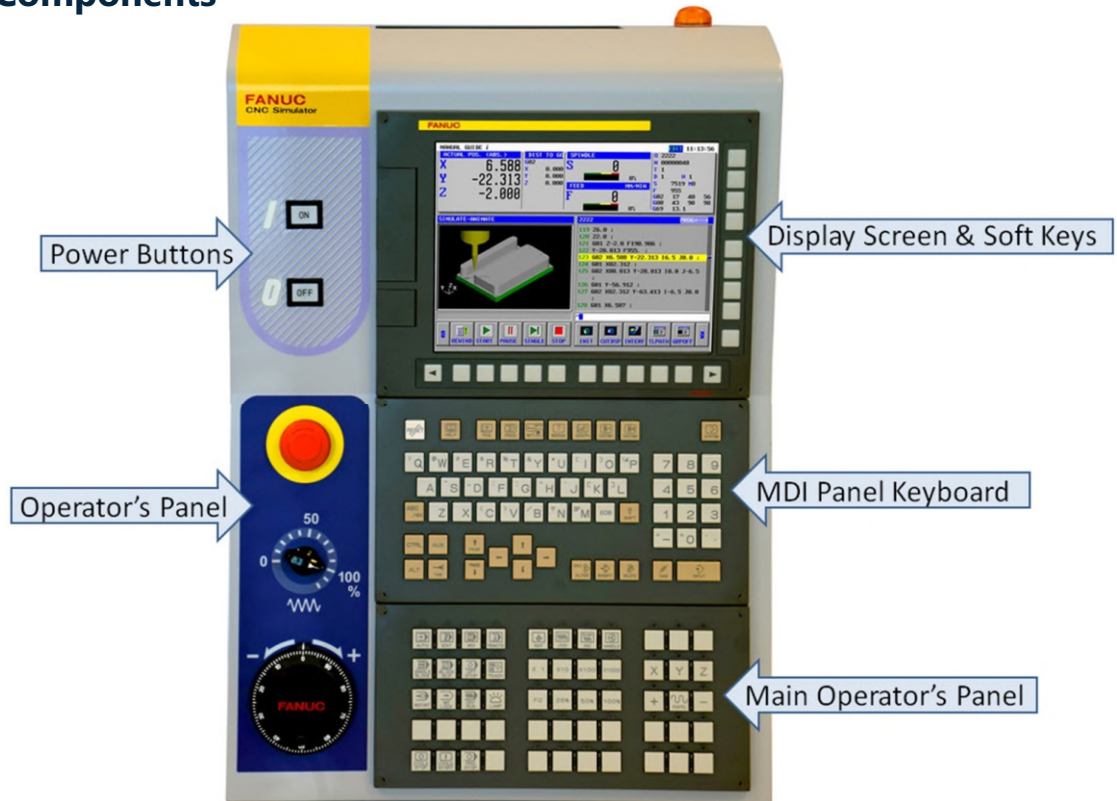
Since 1992

www.hytechautomation.in



QUICK TOUR OF THE FANUC SIMULATOR

1. Main Components



- ▲ **Power buttons**
 - ▲ These buttons are used to turn the simulator on and off.
- ▲ **Display screen & soft keys**
 - ▲ The display screen shows CNC information. The row of keys just below the display screen and the column of keys to the right of the display screen are called soft keys. Their functions change based upon display screen mode. They are used to make selections in the current display screen mode.
- ▲ **MDI panel keyboard**
 - ▲ Like the keyboard of a personal computer, this keyboard allows you to enter data.
- ▲ **Main operator's panel**
 - ▲ This is the primary operator's panel. It contains most of the buttons needed to operate a CNC machine, including those related to the primary focus of this lesson: the operator's panel mode functions.
- ▲ **Operator's panel**
 - ▲ This second operator's panel contains more functions needed to operate a CNC machine.

HYTECH

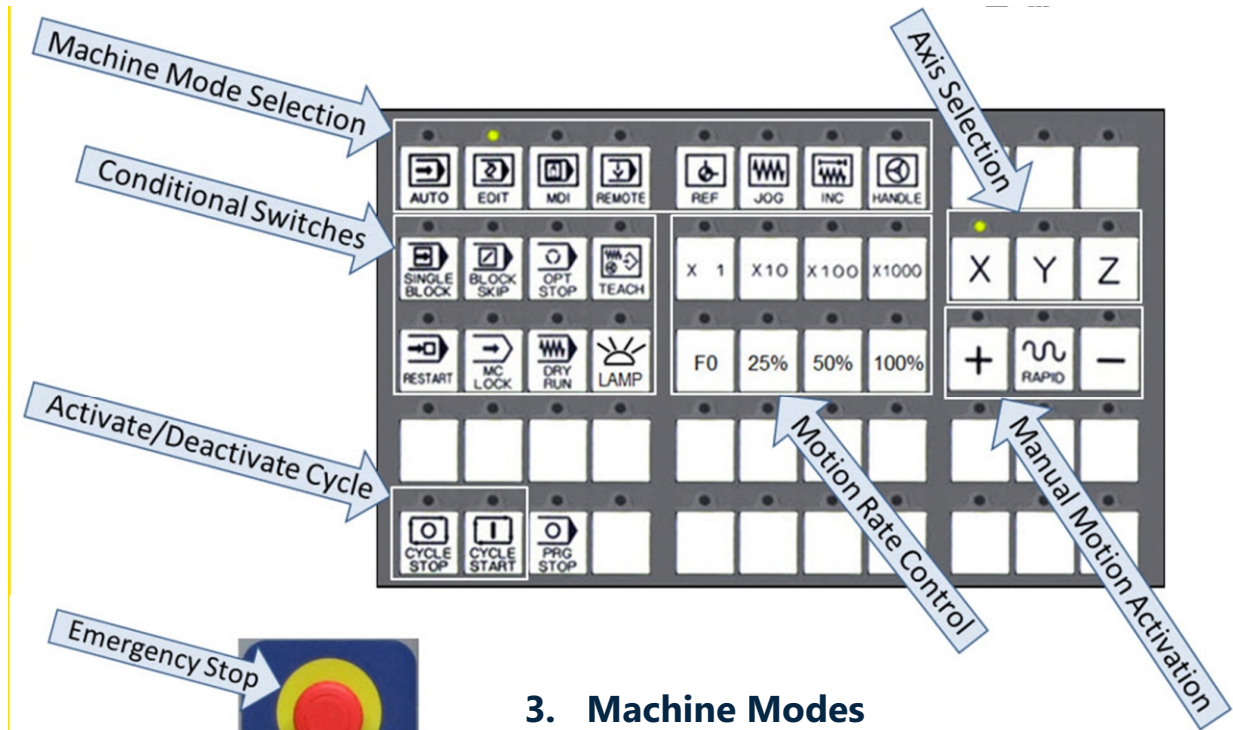
Since 1992

www.hytechautomation.in

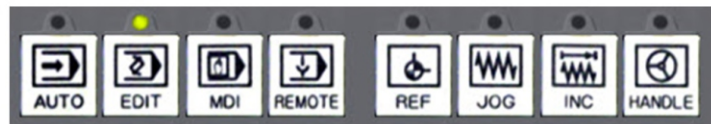


QUICK TOUR OF THE FANUC SIMULATOR

2. Operator's Panels



3. Machine Modes



AUTO: Run a program from internal memory.

EDIT: Modify a CNC program in memory.

MDI (manual data input): Activate manually entered CNC commands.

REMOTE: Run a program from an external device.

REF (reference return): Manually send the axes to the reference position.

Jog: Manually move axes by pushing a button and activate machine accessories.

INC (Incremental Jog): Manually move axes by a predetermined amount.

HANDLE: Manually move axes by turning a handwheel.

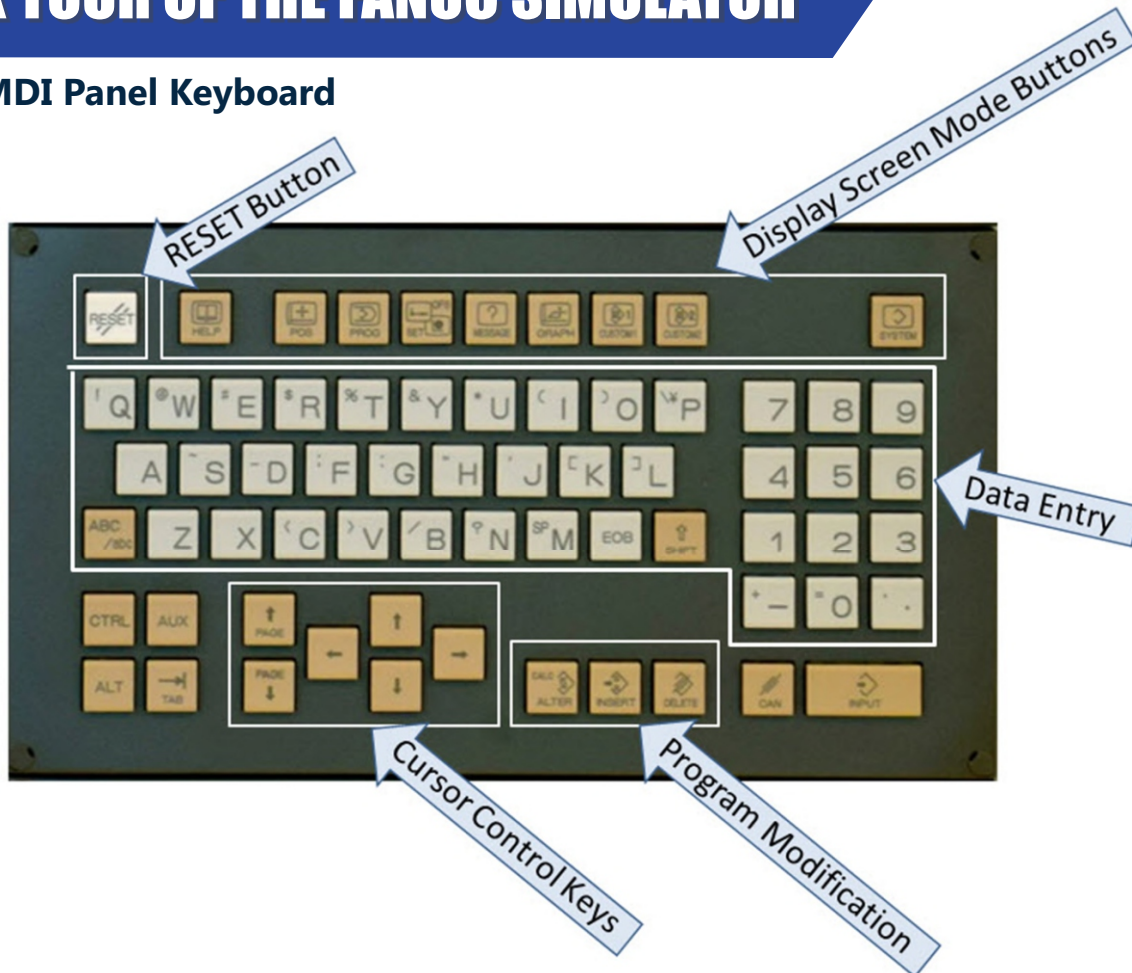
HYTECH

Since 1992
www.hytechautomation.in



QUICK TOUR OF THE FANUC SIMULATOR

4. MDI Panel Keyboard



5. Display Screen modes



HELP: Get help.

POS (position): Display current axes positions.

PROG (program): Work with programs. **OFS / SET** (offset and setting): Enter/modify offsets and common settings.

MESSAGE: Display alarms and messages.

GRAPH: View a tool path or simulation of a program's execution.

SYSTEM: View and modify system data.

HYTECH

Since 1992


www.hytechautomation.in



QUICK TOUR OF THE FANUC SIMULATOR

6. Move an Axis Using JOG

- ▲ Needed when taking measurements during setup:
 - ▲ Measuring program zero assignment values
 - ▲ Measuring tool lengths

1) Press the operator panel  button.

2) Press the MDI panel keyboard  button until ABSOLUTE page appears.

3) Press the button for the axis to move: X , Y , or Z .

4) Select the motion rate with (0 is stopped, 100 is  the fastest).

5) Press and hold the + or - button and watch the axis display register change for the selected axis.

Watch the Axis Move →

ACTUAL POSITION				L31.NC N00000			
ABSOLUTE				MACHINE	DISTANCE TO GO		
X	-4.7156	X	-119.776				
Y	0.0000	Y	0.000				
Z	0.0000	Z	0.000				
MODAL				F	0.00 INCH/M		
G00	G80	G15	F	M	S1	0 /MIN	
G17	G98	G40.1	H				
G90	G50	G25	D				
G22	G67	G160	T				
G94	G97	G13.1	S				
G20	G54	G50.1					
G40	G64	G54.2					
G49	G69	G80.5					
				PARTS COUNT	962		
				RUN TIME	1H 5M 2S		
				CYCLE TIME	0H 0M 0S		
				A>_			
				S	0T00000000		
				JOG *****	11:03:43		
				ABSOLUTE	RELATIVE	ALL	(OPRT)
				TE	VE		

HYTECH


Since 1992
www.hytechautomation.in



QUICK TOUR OF THE FANUC SIMULATOR

7. Move an Axis Using the Hand-wheel

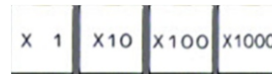
- ▲ Needed when taking measurements during setup:
 - ▲ Measuring program zero assignment values
 - ▲ Measuring tool lengths

1) Press the operator panel  button.

2) Press the MDI panel keyboard  button until ABSOLUTE page appears.

3) Press the button for the axis to move: X , Y , or Z .

4) Select the motion rate with (X1 is slowest, X1000 is fastest).



5) Turn the and watch the axis display values change (clockwise is the positive direction, counter-clockwise is the negative direction).



Watch the Axis Move →

ACTUAL POSITION				L31.NC N00000	
	ABSOLUTE	MACHINE	DISTANCE TO GO		
X	-4.7156	-119.776		X	
Y	0.0000	0.000		Y	
Z	0.0000	0.000		Z	
MODAL				F	0.00 INCH/M
				S ₁	0 /MIN
600	680	615	F	M	
617	698	640.	1H		
690	650	625	D		
622	667	6160	T		
694	697	613.	1S		
620	654	650.	1		
640	664	654.	2		
649	669	680.	5		
				PARTS COUNT	962
				RUN TIME	1H 5M 2S
				CYCLE TIME	0H 0M 0S
				A>_	
				S	0T00000000
				JOG *****	11:03:43
				ABSOLUTE	RELATIVE
				TE	VE
				ALL	(OPRT)

HYTECH

Since 1992
www.hytechautomation.in



QUICK TOUR OF THE FANUC SIMULATOR

8. Enter WORK Offsets

- ▲ You measure the program zero assignment values and find them to be :
 - ▲ In X: -13.2775
 - ▲ In Y: -12.3763
 - ▲ In Z: -13.6746


1) Any operator panel mode can be selected.



2) Press the MDI panel keyboard  button until the OFFSET page appears.

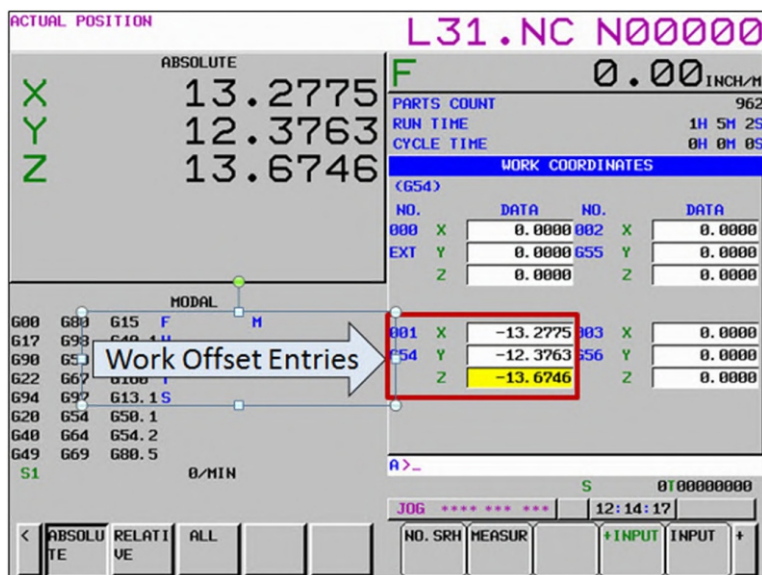
3) Press the  soft key.

4) Using the cursor control keys , bring the cursor to the X register of WORK offset 1 (G54).

5) Enter -13.2775 and press the MDI panel keyboard  key.

6) Press the  key, enter -12.3763 and press the  key.

7) Press the  key, enter -13.6746 and press the  key.



ACTUAL POSITION

L31.NC N00000

ABSOLUTE

X 13.2775

Y 12.3763

Z 13.6746

MODAL

600 680 615 F M

617 698 640 44

698 653

622 667 0100 1

694 697 613.1 S

620 654 650.1

640 664 654.2

649 669 680.5

S1 0/MIN

F 0.00 INCH/M

PARTS COUNT 962

RUN TIME 1H 5M 2S

CYCLE TIME 0H 0M 0S

WORK COORDINATES

(G54)

NO.	DATA	NO.	DATA
000 X	0.0000	002 X	0.0000
EXT Y	0.0000	055 Y	0.0000
Z	0.0000	Z	0.0000
001 X	-13.2775	003 X	0.0000
54 Y	-12.3763	056 Y	0.0000
Z	-13.6746	Z	0.0000

A>_

JOG ***** 12:14:17

NO. SRH MEASUR +INPUT INPUT +

HYTECH

Since 1992

www.hytechautomation.in




QUICK TOUR OF THE FANUC SIMULATOR

9. Enter Tool Offsets

- ^ You measure the lengths of tools 1-3 and find them to be:
 - ^ 6.4763
 - ^ 7.4522
 - ^ 5.6674


1) Any operator panel mode can be selected.


2) Press the MDI panel keyboard  button until the OFFSET page appears

3) If necessary, Press the  soft key.

4) Using the cursor control keys , bring the cursor to the LENGTH (GEOM) register for offset 1 .

5) Enter 6.4763 and press the MDI panel keyboard  key.

6) Press the  key, enter 7.4522 and press the  key.

7) Press the  key, enter 5.6674 and press the  key.

OFFSET L31.NC N00000

NO.	(LENGTH)		(RADIUS)		RELATIVE	
	GEOM	WEAR	GEOM	WEAR		
001	6.4763	0.0000	0.0000	0.0000	X 13.2775	
002	7.4522	0.0000	0.0000	0.0000	Y 12.3763	
003	5.6674	0.0000	0.0000	0.0000	Z 13.6746	
004	0.0000	0.0000	0.0000	0.0000	ABSOLUTE	
005	0.0000	0.0000	0.0000	0.0000		X 13.2775
006	0.0000	0.0000	0.0000	0.0000		Y 12.3763
007	0.0000	0.0000	0.0000	0.0000	Z 13.6746	
008	0.0000	0.0000	0.0000	0.0000	MACHINE	
009	0.0000	0.0000	0.0000	0.0000		X 0.000
010	0.0000	0.0000	0.0000	0.0000		Y 0.000
011	0.0000	0.0000	0.0000	0.0000	Z 0.000	
012	0.0000	0.0000	0.0000	0.0000		
013	0.0000	0.0000	0.0000	0.0000		
014	0.0000	0.0000	0.0000	0.0000		
015	0.0000	0.0000	0.0000	0.0000		
016	0.0000	0.0000	0.0000	0.0000		

Tool Offset Entries

A>_ JOG ***** 12:34:22 S 0T00000000

< NO. SRH INP. C. +INPUT INPUT ERASE F INPUT F OUTPUT

HYTECH

Since 1992
www.hytechautomation.in




QUICK TOUR OF THE FANUC SIMULATOR


10. Load a Program

▲ **Note :** In order to perform the balance of procedures in this quick tour, you must download the following program from our website and place it in the root folder on a USB memory stick:

▲ www.cncci.com/Practice.nc


1) Insert the USB memory stick in the FANUC simulator's USB port.

2) Press the  machine mode switch button.

3) Press the  (for program) display screen mode button until the PROGRAM FOLDER page appears.

4) Press the  soft key.

5) If necessary, press the  soft key until DEVICE CHANGE appears as one of the soft key choices.


6) Press the soft key under .



7) Press the soft key under **USB MEM.**

8) Using the cursor control keys, place the cursor on the program named **PRACTICE.NC.**

9) Press the right-most soft key until  appears as one of the soft key choices.

1) If you cannot find the **F INPUT** soft key, check the IO CHANNEL setting on the SETTING (HANDY) page. It must be set to 17 for this activity (MDI mode must be selected).

10) Press the soft key under .

11) Press the soft key under , then press the soft key under .

1) The file name (PRACTICE.NC) appears next to **/F:**.

12) Press the soft key under  (for execute) to complete the action.

1) The program name (**PRACTICE.NC**) appears at the top-right of the display screen.

HYTECH









Since 1992

www.hytechautomation.in



QUICK TOUR OF THE FANUC SIMULATOR

11. Run a Program

- 1) Press the operator panel  button.
- 2) Press the MDI panel keyboard  button until the a program appears.
- 3) Press the MDI panel keyboard  button.
 - a. Confirm that the cursor is on program **PRACTICE.NC**.
- 4) Press the operator panel  button.
- 5) Press the MDI panel keyboard  button until the ABSOLUTE page appears.
- 6) Press the operator panel  button until its light comes on.
- 7) Set the  switch to 100.
- 8) Press the operator panel  button and watch the axis display registers move while the program executes.
 - a. When the CNC finishes executing the program, axes will stop moving.

HYTECH

Since 1992

www.hytechautomation.in



QUICK TOUR OF THE FANUC SIMULATOR

12. Graph a Program (see the tool path)

- ▲ NOTE: Run the program (using the previous procedure) first.
- ▲ NOTE: Other Graphic Parameter settings may be required to view the program as it is shown in this procedure.

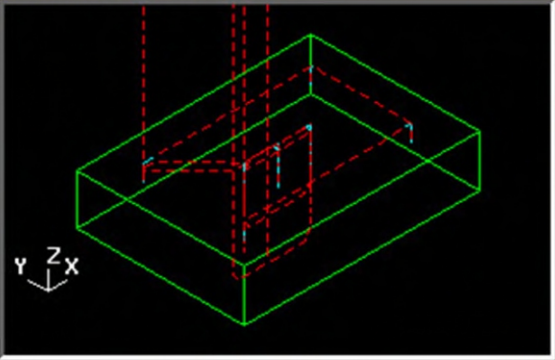
1) Press the MDI panel keyboard  button.











2) Press the  soft key.

3) Press the operator panel  button and watch the tool path while the program executes.

MANUAL GUIDE i (CNC_MEM/USER/PATH1) MEM 10:00:27

ACTUAL POS. (ABS.)		DIST TO GO		SPINDLE S1		O PRACTICE---	
X	0.2500	G00	X 0.0000	S	3735	N	00000000
Y	-0.1250		Y 0.0000		0%	T	5
Z	0.0000		Z 0.0000	F	0.00	D	0 H 0
					0%	S	1530 M9
						F	0
						G00	17 40 54
						G80	49 90 98
						G69	13.1

DRAWING—TOOLPATH	PRACTICE---
	<pre>1 <PRACTICE.NC> ; 2 (Class: FCTMCP0) ; 3 ; 4 N010 G17 G20 G23 ; 5 N020 G40 G64 ; 6 N030 G69 G80 ; 7 ; 8 (SPOT DRILL) ; 9 N040 M06 T01 ; 10 N050 G54 G90 S700 M03 ; 11 N055 G0 X0.5 Y0.5 (PT 1) ; 12 N060 G43 H01 Z0.1 M08 ;</pre>

									
REWIND	O LIST	CHGDISP	N SRCH	O SRCH	ACTPOS	PRESET	MESLST	GRPOFF	

HYTECH

Since 1992


www.hytechautomation.in





QUICK TOUR OF THE FANUC SIMULATOR

13. Delete a Program from CNC Memory


▲ **NOTE:** In this procedure, you will delete the PRACTICE.NC program, leaving the simulator in the same condition you found it.

1) Press the operator panel  button.

2) Press the MDI panel keyboard  button until the **PROGRAM FOLDER** page appears.


3) Press the  soft key until the  soft key is shown.

4) Press the  soft key.

5) Press the soft key under  .

6) Press  repeatedly to bring the cursor to the program named **PRACTICE.NC**.

7) Press the  soft key.

8) Press the  soft key (be careful, there is no confirmation)