

CNC TURRET PUNCH PRESS
AMADAN-04P-C
MMC US VERSION SYSTEM

OPERATOR'S MANUAL

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AMADAN 04PC US-01198910

CHAPTER I

INTRODUCTION

The **AMADAN-04P-C** consists of two separate systems, the CNC (Computer Numerical Control) and the **MMC** (Man Machine **Control**). This manual describes **the** operation of **the AMADAN-04P-C MMC** software system. The **AMADAN-04P-C** is the controller used for **AMADA** Turret Punch Presses (COMA series and **PEGA** series machines).

For a description of CNC operation, programming and tooling for the **AMADA** Turret Punch Press, refer to their respective manuals.

HOW THIS MANUAL IS ORGANIZED

CHAPTER II

Highlights the features and advantages of the U.S. VERSION MMC.

Provides overviews of starting up MMC system, CRT display format, menu system and activating functions.

CHAPTER III

Explains the MAIN MENU HELP.

Explains the JOB SCHEDULER features and its operation.

Explains the PART **SETUP** data display and local menu.

Explains the TOOL SETUP data display and local menu.

Explains the PROGRAM DIRECTORY features and operation.

CHAPTER IV

Presents **the** EDITOR general information.

Explains the EDITOR configuration functions.

Explains the **EDITOR** programming **aids**.

Explains the EDITOR word processing functions.

Explains the **EDITOR** file management functions.

CHAPTER V

Presents the GRAPHICS processor general information.

Explains the GRAPHICS various operation guidance.

Explains the GRAPHICS snapping **coordinates**.

Explains the GRAPHICS function operations.

CHAPTER VI

Explains the **MAIL** message display.

Explains the error MESSAGE display.

Explains the capabilities of. DNC.

APPENDIX A **Lists** the error codes of the part program editor and the graphics **processor**.

CHAPTER II

GUIDANCE

**MMC U.S. VERSION FEATURES
SYSTEM STARTUP**

MMC U.S. VERSION FEATURES

The following list highlights the features of the U.S. VERSION MMC.

MAIN MENU HELP

There are four areas of help:

***Operation** Help' briefly explains the function of the items on the MMC main menu.

'Maintenance Help' describes the mechanical maintenance to be performed daily, weekly and monthly to keep the punch press in top condition.

'Input Signal Help' displays an explanation of the CNC diagnostics for input signals.

***Output** 'Signal Help' displays an explanation of the CNC diagnostics for output signals.

JOB SCHEDULER

The job scheduler manages the sequence in which part programs are processed.

The job scheduler page shows the status of each job on the job scheduler.

Job schedule data can be entered, changed, or deleted while the machine is in operation. This allows for flexible machine scheduling.

'Help' displays two options. ***Job Scheduler Operation**' displays how to input or change the job schedule data and how to start the job scheduler. ***Part Program Directory**' displays a list of part programs that are registered in the CNC.

PART SETUP

Part setup displays information for each part program: material size and type, damp positions, multiple part setting, etc.

There are three part setup pages: ***Active Part Setup**' page displays the part setup data for the current CNC part program, **'Next Part Setup**' page displays the part setup data for the program scheduled to be processed next on the Job Scheduler and **'Select Part Setup**' page displays the part setup data for a program selected by-the operator.

'Help' displays a list of part programs that are registered in the CNC.

TOOL SETUP

Tool setup displays the tools associated with each part **program**.

There are three tool setup pages: "**Active** Tool Setup" page displays the tool setup data for the current CNC part program, 'Next Tool Setup' page displays the tool setup data for the program scheduled to **be** processed next on the Job Scheduler and Select Tool Setup' page displays the tool **setup** data for a program **selected** by the operator.

'Help' displays a list of **part programs** that are **registered** in the **CNC**.

PART PROGRAM DIRECTORY

Part program directory page displays a list of part programs that are registered in the CNC.

'Search' looks for a specified part program number.

"**Select**" will make the part program specified by the cursor the current CNC part program.

"**Delete**" will **delete** the part program specified by the cursor from CNC part program storage.

'Help' displays operational help for the part program **directory** page.

PART PROGRAM EDITOR

The editor can be used to **enter** a **new** part program or **change** an existing part program.

There are many **full-screen wordprocessing** functions: cursor control functions, delete functions, search functions, block **functions**, etc.

"**On-line Help**" displays a window **when** a **G** or **M** code is typed, which **defines** all the parameters required for this code. This function can **be** toggled ON/OFF.

"**On-line Syntax Check**" performs a syntax error check of each program line when ENTER is pressed. This function can be toggled to ON/OFF.

"Help" has four options: 'G-code' displays an explanation of **G** and **M** code functions, 'Function **key**' explains each function key's use, 'Editor commands' summarizes all **wordprocessing** functions for quick **reference**, 'On-line help' toggles On-line Help function ON/OFF.

"**Part Setup**" is used for modifying the Part Setup data.

"**File**" has five options: "**Finish**" saves the program and ends the edit session, 'Save & continue' saves the program and continues **the edit** session, "**Quit**" ends the **edit** session without saving any changes, 'Merge' inserts a specified program into **the** program being edited, "**Dir**" displays a list of part programs that **are** registered in the CNC.

"Tool" function displays the Tool setup window for modifying tool data or displays a list of tools used by the program.

"Memory" function is used to store and recall frequently used values.

Editor will perform a syntax check on **the** entire program upon request.

'Error' function displays a list of errors found in the program or positions the **cursor** at **the** next occurrence of an error.

'Block' function defines the beginning and end of a section of text in the program, and is used to copy, move, or **delete** this text.

"Goto/find" has four **GOTO** commands and **three search** commands: **GOTO commands are used** to move the cursor to top of the program, end of the program, specified line or specified column in the same line. Search commands **are** used to find a specified string of characters. find the next occurrence of the specified string of characters or replace the specified string with new data.

'Password' function is used to enter a password which protects part programs from editing by unauthorized persons.

GRAPHICS PROCESSOR

Graphics processor draws part shape.

Graphics processor executes error check functions: Syntax check, axis over-travel check, clamp punch dead-zone check, work dead-zone check, etc.

"Zoom" enlarges an area of the drawing defined by two diagonally opposite corners of a rectangle.

'Whole View' displays the whole sheet.

'Recall View' displays the image displayed before the current one.

"Grid On/Off" activates/de-activates the grid feature.

'Measure' measures the **distance** between two points, the angle from the **first** point to the second and delta x and y between the points.

Select **Point** is used to find the coordinates of the cursor or to find the coordinates of the nearest snap point.

'Choose Pattern' shows the G-code statement that generated the pattern shape.

MAIL

ONC **status notifies** the operator of the arrival of the new mail **from** the host computer.

Mail page displays up to five mail messages, in the opposite order in which **they** were sent.

ERROR MESSAGE EXPLANATION

Alarm status notifies the operator that CNC alarms have occurred.

Error message explanation page displays an alarm explanation for current CNC alarms and how to recover from them.

Up to eight messages may be displayed. If there are **more** messages than can fit on one page, pressing the **page** down **key** will display additional messages.

DNC

ONC on the MMC and SMART ONC on the host computer allow the transmission of part programs, part and tool setups, job schedule data and mail from a host computer.

ONC and SMART ONC allow part programs, part and tool setups, job schedule data and a program **directory** to be received by the host computer.

ONC and **SMART** ONC **delete** part programs from the CNC and both part and tool setup data **stored** in the MMC.

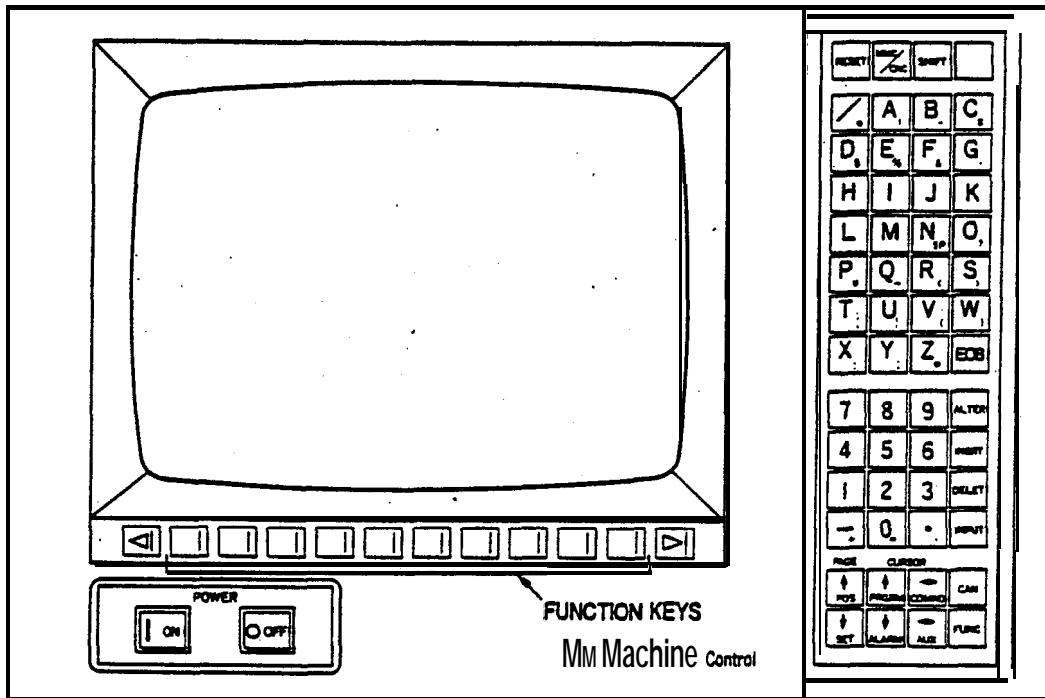
ONC status displays messages: 'ONC Ready' means that communication between **the** host computer and **AMADAN-04P-C** is possible. **"DNC Active"** means that the host computer and **AMADAN-04P-C** are communicating. **"DNC Not Ready"** means that communication between the host computer and **AMADAN-04P-C** is not possible.

ONC cannot run when **the** Part Program Editor or Graphics Processor is in use (ONC Not Ready).

SYSTEM START-UP

CHANGING CNC/MMC DISPLAYS

The **AMADAN-04P-C** has displays for CNC and MMC. Both CNC and MMC systems **are started** automatically when the **AMADAN-04P-C** is powered on. **The CRT initially displays** the CNC Position Page. When you want to work in the MMC system, you must change the CRT to the MMC display by pressing the **"MMC/CNC"** key on the **MDI panel** of the **AMADAN-04P-C**. This **"MMC/CNC"** key toggles **between** the CNC and MMC displays. The following figure shows the CRT & MOI panel. The **"MMC/CNC"** key **is the** second key from **the** left in the top row of **keys**.



The following keys on the keypad **are** used for programming and related operations:

MMC/CNC This key is **used** to select the MMC or CNC operation mode.

A to Z, 0 to 9, / (slash), - (minus sign), . (period), , (comma)
These keys are used to enter data and commands.

SP (space), () (parentheses)
These three keys are **used** in combination with the SHIFT key when editing a part program.

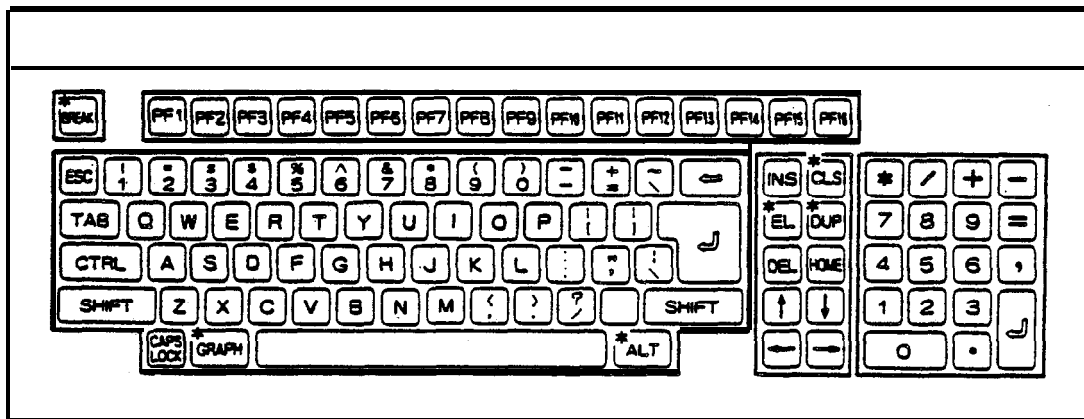
INPUT This key is used to **confirm** and input the entered data.

P A G E These two keys **are** used to **change** the displayed page to **the** previous or next page.

CURSOR **The** *up, down, left* and *right* keys are **used** to shift the regular **cursor** in ORAW function which indicates the position for the entry of data. All of the four keys **are** also used to move **the** crosshair cursor.

CAN This key **erases** one **character** that is immediately in front of the **regular** cursor.

KEYBOARD



*: unused

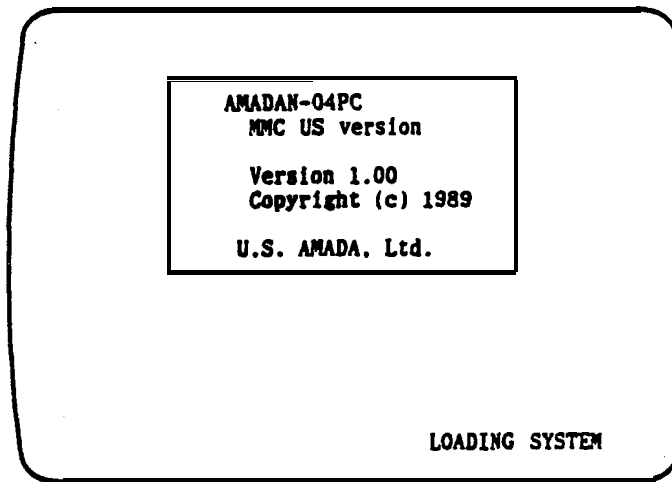
The keys from **PF1** to **PF10** have the same functions as **the softkeys** under the CRT 8 MOI panel.

The **PF11** key and **PF12** key have the same functions on the left side and right side keys (◀, ▶) under the CRT. The usage of **INS**, **DEL HOME** and four cursor keys is written in the CHAPTER IV.

STARTING MMC SYSTEM

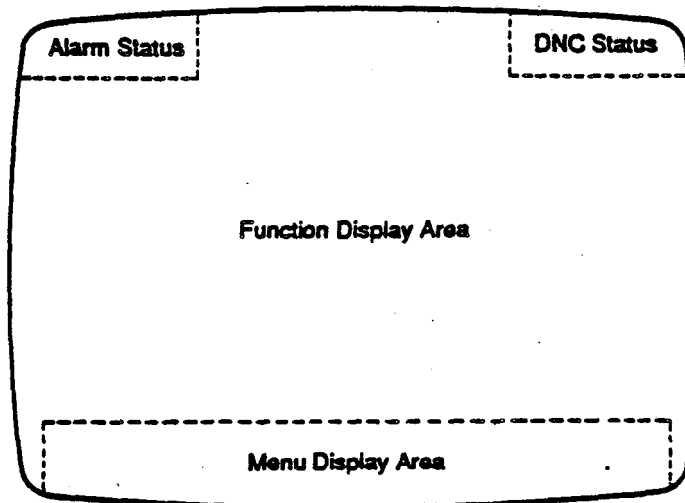
The **MMC** system is started automatically as described in the previous section. The start up procedure of the **MMC** system is:

- Executes memory parity check
- Loads the operating system (Concurrent DOS).
- Installs system libraries.
- **Displays** Start Up Page to indicate loading U.S. Version MMC system as shown **in** figure below.
- **Displays** Job Scheduler as initial display. Awaits selection of any function by operator.



BASIC CRT DISPLAY FORMAT

The CRT display is divided into four areas:



Alarm status display area

When an alarm occurs in the CNC, the CNC alarm number is displayed. Select the **"MESSAGE"** function for an explanation of the CNC alarm and how to correct it.

When job confirmation is required by the job scheduler, 'Job Confirm' is displayed.

DNC status display area

One of following messages is displayed in the DNC status area:

- | | |
|-------------------|--|
| DNC Ready | Communication between a host computer and AMADAN-04P-C is possible. |
| DNC Not Ready | Communication between a host computer and AMADAN-04P-C is not possible. The MMC will not respond to requests from the host computer. |
| DNC Active | The host computer and AMADAN-04P-C are communicating. |
| MAIL | Flashes to indicate that mail has been received from the host computer . |

Function display area

Data is displayed for each function in the following manner:

Main Help Menu page.

- Operation Help page.
- Maintenance Help Page.
- Input** Signal Help Page.
- Output Signal Help Page.

Job scheduler Page.

Part Setup Page (Active, Next and Select).

Tool Setup Page (Active, Next and Select).

Part Program Directory Page.

Part Program Editor Page.

- Password Input Page (requires entry of password to use editor).
- Part Program Select Page (displays a directory to aid in selection of **program**).

Part Drawing Page (Graphics Processor Page).

- Part Program Select Page (displays a directory to aid in selection of program).

Mail Page.

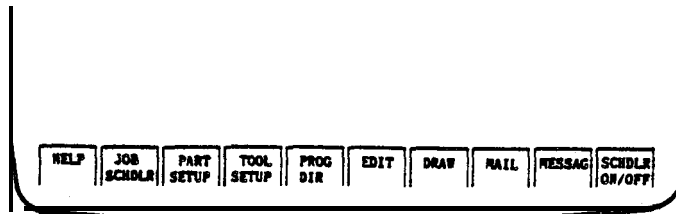
Error Message Explanation Page.

Menu display area

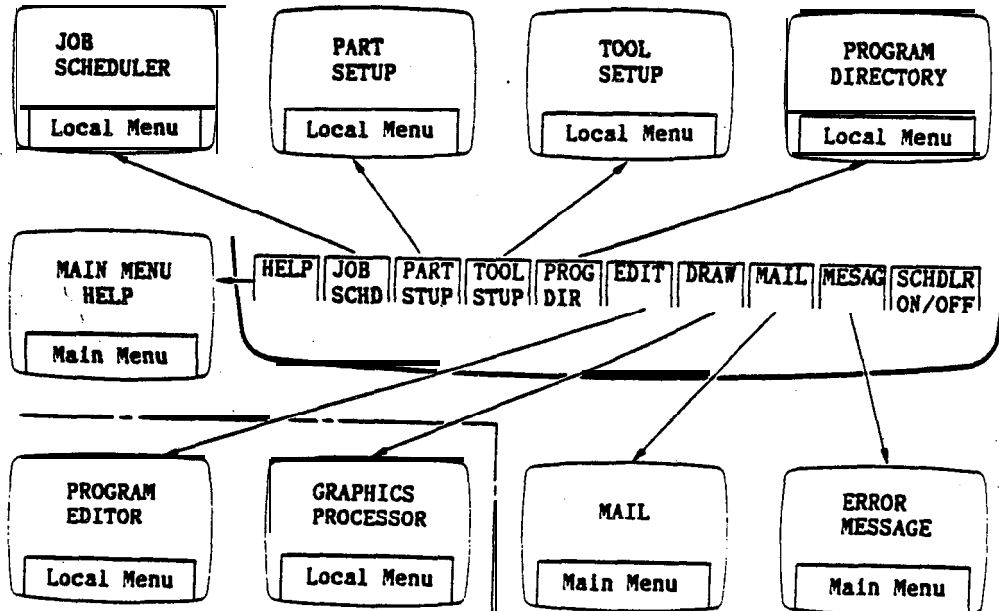
There is one main menu and six local menus displayed in the Menu Display Area. The menus are color coded, the main menu is green, and the local menu is yellow. If a function is selected, its color will become magenta. The following sections will describe the use of the main menu functions, each local menu function and menu toggle keys.

MAIN MENU

Each function can be selected from the following main menu:



- HELP** Displays Main Help Menu Page.
- JOB SCHDLR** Displays Job Scheduler Page with local menu.
- PART SETUP** Displays Part Setup Page with local menu.
- TOOL SETUP** Displays Tool Setup Page with local menu.
- PROG DIR** Displays Part Program Directory Page with local menu.
- EDIT** Displays Password Input Page or Part Program Select Page with local menu to start Part Program Editor.
- DRAW** Displays Part Program Select Page with **local** menu to start Graphics Processor.
- MAIL** Displays Mail Page.
- MESSAGE** Displays Error Message Explanation Page.
- SCHDLR ON/OFF** Turns on/off Job Scheduler.



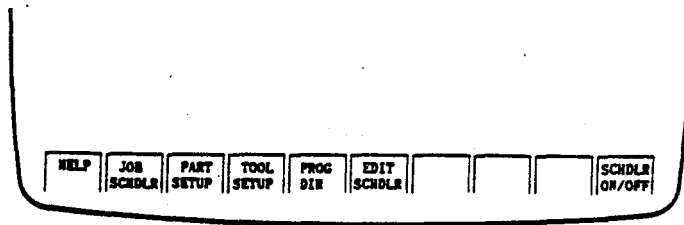
DNC NOT READY

DNC READY

LOCAL MENU

The **following** briefly explains the use of each local menu:

Job Scheduler Menu:



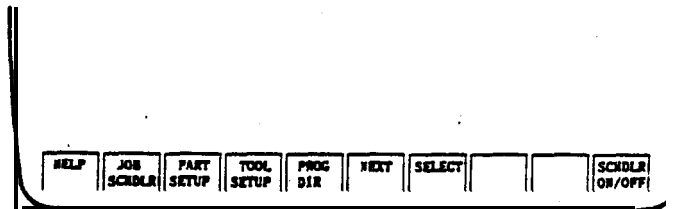
HELP Displays help window.

JOB SCHEDLR Displays Job Schedule data.

EDIT SCHEDLR Edits job schedule data.

(Note) It is possible to go to Part Setup, Tool Setup or Part Program Directory from **Job Scheduler** Local Menu.

Part Setup Menu:



HELP Displays help window.

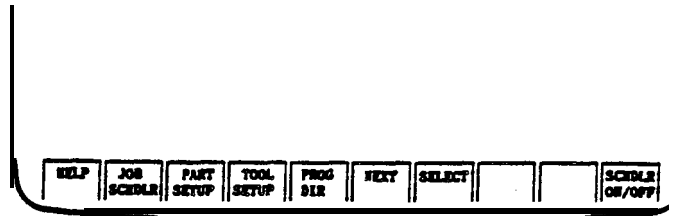
PART SETUP Displays Active Part Setup Data.

NEXT Displays Next Part **Setup** Data.

SELECT Displays Select Part Setup Data.

(Note) It is possible to go to Job Scheduler, Tool Setup or Part Program Directory from Part Setup Local Menu.

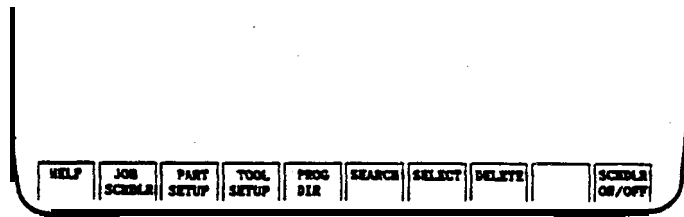
Tool Setup Menu:



- HELP** Displays help window.
- TOOL SETUP** Displays Active Tool Setup Data
- NEXT** **Displays** Next Tool Setup Data
- SELECT** Displays Select Tool Setup Data.

(Note) It is possible to go to Job **Scheduler**, Part Setup or Part Program Directory from Tool Setup Local Menu.

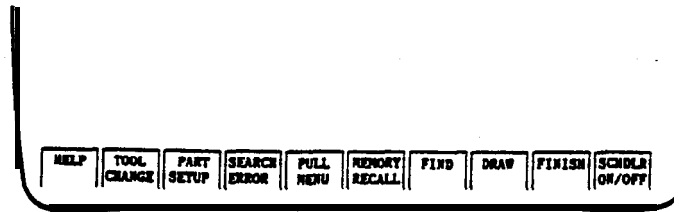
Part Program Directory Menu:



- HELP** Displays help window.
- PROG DIR** Displays a **list** of part programs registered in the CNC.
- SEARCH** Searches for a specified program number.
- SELECT** Make selected part program active at the CNC.
- DELETE** Deletes a part **program** from CNC memory.

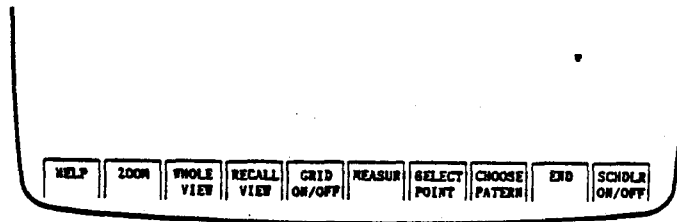
(Not:)) It is possible to go to Job Scheduler, Part Setup or Tool Setup from Part Program Directory Local Menu.

Part Program Editor Menu:



HELP	Displays help menu window.
TOOL CHANGE	Displays Tool Change window for modification of tool data .
PART SETUP	Displays Part Setup Page for modification of part setup data .
SEARCH ERROR	Searches for the next error in part program .
PULL MENU	Activates pull-down menu.
MEMORY RECALL	Recalls a stored value
FIND	Finds specified string of characters.
DRAW	Runs the Graphics Processor.
FINISH	Stores modified part program in CNC memory.

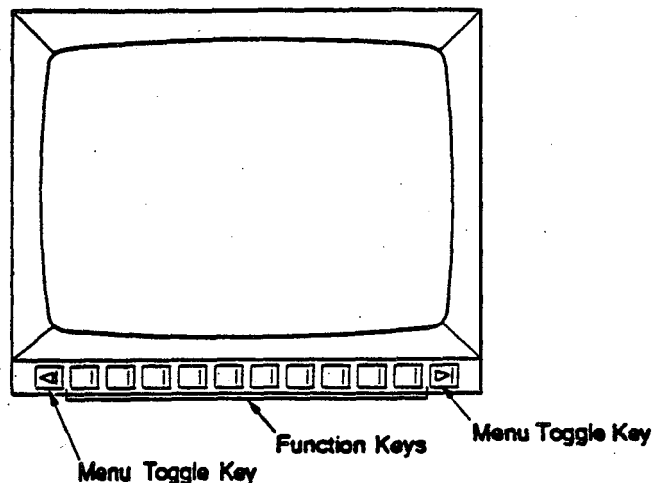
Graphics Processor Menu:



HELP	Displays a help message.
ZOOM (I	Enlarges an area of the drawing defined by two diagonally opposite corners of a rectangle.
W H O L E VIEW	Displays the whole sheet.
RECALL VIEW	Displays the image displayed before the current one.
GRID ON/OFF	Act&es/de-activates the grid feature,
MEASUR	Measures distance between the two points.
SELECT POINT	Obtains the X and Y coordinate of a point.
CHOOSE PATTERN	Shows the G-code statement that generated the pattern shape.
END	Terminates me Graphics display.

TOGGLING MAIN MENU AND LOCAL MENU

Pressing the left or right 'Menu Toggle' key toggles between **the** main menu and most recently selected local menu. (Main Menu Help, Mail and Message pages do not have local menus.) 'Menu Toggle' keys **are** used to display the main menu up in order to access functions found only on the main menu.



EXCEPTION: If the Graphics Processor was called from Part Program Editor, the main menu **is** not displayed even if 'Menu **Toggle**' keys were pressed.

SELECTING A FUNCTION

The Initial MMC display is the Job Scheduler Page-with the main menu. At this time, the MMC system is waiting for a function to be selected from the main menu. Also, DNC is ready to communicate with a host computer.

The following is the Initial Display:

JOB SCHEDULER : J2001										DNC Ready	
JOB NO.	PROG NO.	JOB PRI	SHEETS REQ	STOP DONE		ESTIMATE	TIME ACTUAL	JOB STATUS			
1	01289	5	23	12	#	00:38:36	00:20:01	SUSPEND			
2	03457	8	96	0	Y	01:23:56	00:00:00	IN QUE			
3	00000	0	0	0	#	00:00:00	00:00:00	-			
4	01034	4	12	0	#	00:24:48	00:00:00	NEXT			
5	04029	7	9	0	Y	00:02:34	00:00:00	IN QUE			
6	02578	8	5	0	#	00:01:29	00:00:00	IN QUE			
7	01000	3	12	6	Y	00:24:40	00:12:56	ACTIVE			
8	00000	0	0	0	#	00:00:00	00:00:00	-			
9	00000	0	0	0	#	00:00:00	00:00:00	-			
10	01967	3	8	8	#	00:12:34	00:12:36	COMPLETED			
11	01968	3	6	6	#	00:34:09	00:34:00	COMPLETED			
12	01852	0	12	0	Y	01:12:29	00:00:00	SKIPPED			
13	00000	0	0	0	#	00:00:00	00:00:00	-			
14	00000	0	0	0	#	00:00:00	00:00:00	-			
15	00000	0	0	0	#	00:00:00	00:00:00	-			
16	00000	0	0	0	#	00:00:00	00:00:00	-			
17	00000	0	0	0	#	00:00:00	00:00:00	-			
18	00000	0	0	0	#	00:00:00	00:00:00	-			
REMAINING SHEETS REQUIRED : 171										EDIT DATE : 05/28/89	
										CURRENT DATE : 04/04/89	
HELP	JOB SCHEDLR	PART SETUP	TOOL SETUP	PRG DIR	EDIT	DRAW	RAIL	MESSAG	SCHEDLR	ON/OFF	

Press the soft key corresponding to the desired **function**.
The following chapters will explain each function in detail.

CHAPTER III

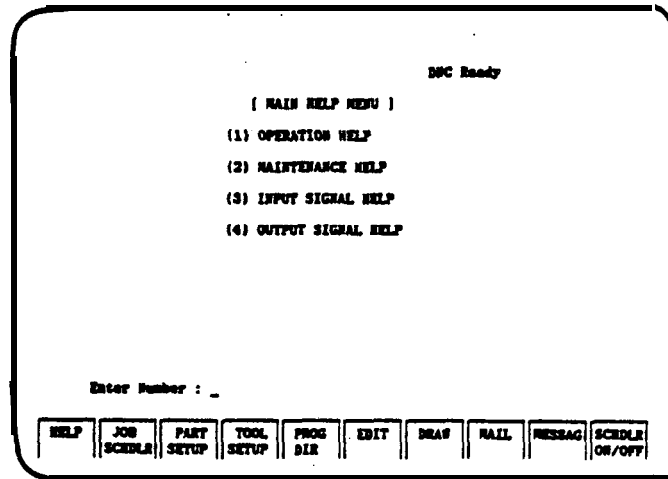
BASIC FUNCTIONS

MAIN MENU HELP
JOB SCHEDULER
PART SETUP
TOOL **SETUP**
PART **PROGRAM** DIRECTORY

MAIN MENU HELP

MAIN HELP MENU

When HELP function key is pressed on the main menu, the Main Help Menu is displayed as below:



Press **1, 2, 3** or 4 to display area of help desired.

Operation help

Briefly explains **the** function of the items on the MMC main menu.

Maintenance help

Describes the mechanical **maintenance** to be performed daily, weekly and monthly to keep the punch press in top condition.

Input signal help

Displays an explanation of the CNC diagnostics for input signals.

Output signal help

Displays an **explanation** of the CNC **diagnostics** for output signals.

VIEWING THE NEXT/PREVIOUS PAGE

Since help may contain **more** than one page the message [- MORE -] on the bottom of the display indicates there are more pages. Use the PgDn/PgUp keys to view the **next/previous** page.

The **help** title on the first line of the display shows what page it is.

On page 1, the PgUp key is ignored.

On the last page, pressing the PgDn key returns to Main Help Menu.

RETURNING TO MAIN HELP MENU

You may return to the Main Help Menu by pressing the ESC key or HELP function key when viewing help information.

(Note) If a main menu soft key other than HELP is pressed, the function selected is displayed.

JOB SCHEDULER

JOB SCHEDULER MENU AND ITS FUNCTION

When the JOB SCHDLR function key is pressed on the main menu, the Job Scheduler page and its local menu are displayed. The JOB SCHEDULER page can also be called from the Part Setup local menu, Tool Setup local menu or Part Program Directory local menu.

**** JOB SCHEDULER : J1002 ****										DNC Ready	
JOB NO.	PROG NO.	JOB PRI	SHEETS REQ	SHEETS DONE	STOP	ESTIMATE	TIME	ACTUAL	JOB STATUS		
1	01289	5	23	12	N	00:38:26		00:20:01	SUSPEND		
2	03457	6	96	0	Y	01:23:56		00:00:00	IN QUE		
3	00000	0	0	0	N	00:00:00		00:00:00	-		
4	01034	4	12	0	N	00:24:45		00:00:00	NEXT		
5	04029	7	9	0	Y	00:02:34		00:00:00	IN QUE		
6	02578	8	5	0	N	00:01:29		00:00:00	IN QUE		
7	01000	3	12	6	Y	00:24:40		00:12:56	ACTIVE		
8	00000	0	0	0	N	00:00:00		00:00:00	-		
9	00000	0	0	0	N	00:00:00		00:00:00	-		
10	01967	3	8	8	N	00:12:34		00:12:34	COMPLETE		
11	01966	3	6	6	N	00:34:09		00:34:00	COMPLETE		
12	01682	0	12	0	Y	01:12:29		00:00:00	SKIPPED		
13	00000	0	0	0	N	00:00:00		00:00:00	-		
14	00000	0	0	0	N	00:00:00		00:00:00	-		
15	00000	0	0	0	N	00:00:00		00:00:00	-		
16	00000	0	0	0	N	00:00:00		00:00:00	-		
17	00000	0	0	0	N	00:00:00		00:00:00	-		
18	00000	0	0	0	N	00:00:00		00:00:00	-		
REMAINING SHEETS REQUIRED : 103						EDIT DATE : 05/28/89		CURRENT DATE : 06/07/89			
HELP	JOB SCHEDLR	PART SETUP	TOOL SETUP	PROG DIR	EDIT SCHEDLR					SCHEDLR ON/OFF	

- HELP Displays help menu window.
- JOB SCHDLR Displays job schedule data.
- EDIT SCHEDLR Edit job schedule data.
- SCHEDLR ON/OFF Activate/de-activate job scheduler.

SCHEDLR ON/OFF is displayed on all menus. It is not necessary to select the job scheduler page to activate/deactivate the job scheduler.

JOB SCHEDULE DATA

The following data is displayed on the job scheduler page.

- JOB SCHEDULER** Shows the job scheduler file name.
- JOE NO.** Shows the job number (1 - 18) assigned to each part program scheduled.
- PROG NO.** Shows the part program number. 00000 is used to clear the data for a job.

JOB PRI

Shows the job priority (0 - 9) which determines the order of job execution. Jobs are executed in order of highest priority.

- 0** - means that the job will be shipped.
- 1** - means that the job is highest priority job.
- 9** - means that the job is lowest priority job.

SHEETS REQ

Shows the number of sheets required for the job; A job with sheets required zero (0) will be skipped.

SHEETS DONE

Shows the number of sheets already processed.

STOP

Shows stop flag.

- Y** - The operator must confirm that the machine is ready to run when this job first becomes active at the CNC.
- N** - The machine setup does not require confirmation.

TIME ESTIMATE

Shows the estimated time to complete the job.

TIME ACTUAL

Shows the actual time spent processing the job.

JOB STATUS

Shows the job status as below:

- ACTIVE** - The job is being processed.
- NEXT** - The job has the second *highest* priority on the schedule.
- IN QUE** - The job is ready to be processed.
- SELECTED** - The job has a higher priority than the job presently being processed It will become the **ACTIVE** job when an end of **cycle** command (ex. **G50**) is executed.
- SUSPEND** - The job has been stopped.
- SKIPPED** - The job will not be processed (**Job** priority or sheets required **is 0**)
- COMPLETE** - **The sheets** processed are equal to the number required.

**REMAINING S H E E T S
REQUIRED**

Shows the total number of *sheets* required to complete all jobs.

EDIT DATE

Shows the date the job schedule data was last edited.

CURRENT DATE

Shows todays date.

JOB SCHEDULER HELP

When the HELP function key is pushed on the job scheduler local menu, the job scheduler help menu is displayed in the help window as follows:

*** JOB SCHEDULER : J1002 ***						DNC Ready
JOB NO.	PROG NO.	JOB PRI	SHEETS REQ	STOP DOWE		JOB SCHEDULER HELP MENU
1	01289	5	23	12	N	
2	00000	6	96	0	Y	(1) JOB SCHEDULER OPERATION
3	01034	0	0	0	N	
4		4	12	0	N	(2) PART PROGRAM DIRECTORY
5	04029	7	9	0	Y	
6	02578	8	5	0	N	
7	01000	3	12	6	Y	
8	00000	0	0	0	N	
9	00000	0	0	0	N	
10	01987	3	8	8	N	
11	01986	3	6	6	N	
12	01652	0	12	0	Y	
13	00000	0	0	0	N	
14	00000	0	0	0	N	
15	00000	0	0	0	N	
16	00000	0	0	0	N	
17	00000	0	0	0	N	
18	00000	0	0	0	N	
REMAINING SHEETS REQUIRED : 103						Enter Number : _

HELP	JOB SCHEDLR	PART SETUP	TOOL SETUP	PROG DIR	EDIT SCHEDLR			SCHEDLR ON/OFF
------	-------------	------------	------------	----------	--------------	--	--	----------------

- (1) Displays an explanation of the job scheduler operation. Included are how to enter or edit job schedule data and how to start the job scheduler.
- (2) Displays a list of part program numbers registered in the CNC with a 20 character comment for each program. If the part program list exceeds one page, use the PgDn/PgUp keys or cursor up/down keys to view the next/previous page.

To close the help window, press the ESC key or any function key except HELP.

ENTERING JOB SCHEDULE DATA

There are two ways to enter data into the job scheduler. Schedule data can be edited on the job scheduler page, or a job schedule file can be sent using Smart DNC.

Editing job data

Editing job data is possible when the machine is running. However, the 'ACTIVE' job cannot be edited. If you want to edit the data of a 'COMPLETE' job, you must first clear its data by entering program number 0 and then it can be edited. The following is the procedure for editing a job:

1. Press EDIT SCHEDLR function key on the job scheduler menu:

Tritter Job Number : _* message is displayed one line above the menu. Job Number is 1 through 18. Otherwise, 'Input Error' message is displayed for momentarily and 'Enter Job Number: _*' is displayed again.

2. Type a job number among 1 **through** 16 and press ENTER (INPUT):
 "Enter Program Number : **O**" message and the pre-registered program number are displayed. The possible program number is 0 through 9999. Otherwise, "Input **Error**" message is displayed for a while and "Enter Program Number : **O**" and the pm-registered program number are displayed again.
 If program number zero (0, 00,000 or 0000) is entered, the data of editing job is cleared and editing a job data is finished.
3. Type program number and press ENTER (INPUT):
 'Enter Job Priority :*****' message and the pm-registered job priority are displayed. There are ten job priority levels 0 to 9. Otherwise, "Input Error" message is displayed momentarily and 'Enter Job Priority : *****' and the pre-registered job priority are displayed again.
Priority 1 is the highest and 9 is the lowest. The job with priority 0 will be skipped.
4. Type job **priority** and press ENTER (INPUT):
 'Enter Required Sheets : *****' message and the preregistered required sheets are displayed.
 The range of required sheets is 0 through 9999. If a value outside this range is entered the message 'Input Error *****' is displayed momentarily and 'Enter **Required** :*****' and the pm-registered required sheets are displayed again.
 A job with required sheets 0 **will** be skipped.
5. Type the number of sheets required and press ENTER (INPUT):
 Stop for Preparation of Job : . and Y or N are displayed.
 The stop flag is set to either **Y(es)** or N(o). The default for this field is N. If a value other than Y or N is entered the message 'Input **Error**' is displayed momentarily and 'Stop for Preparation of Job : . and Y or N are displayed again.
6. Press ENTER (INPUT) to accept the default or Type Y and press ENTER (INPUT):
 All edited data will be saved. if errors are found, the message 'Save Error" is displayed momentarily. The job data should be entered again.

Getting job schedule file from smart DNC

Smart DNC on a host computer has the capability of sending/receiving job schedule files to/from the **AMADAN-04P-C**. Smart DNC allows the creation and editing of job schedule files at the host computer.

When job schedule data is sent from the host computer there are two cases. The **job schedule** file can either have the same name as the current job schedule file in the **AMADAN-04P-C**, or the job schedule file received can have a different name from the current job schedule file in the **AMADAN-04P-C**.

It is possible to receive a job schedule file with the same name as the current job schedule file in the **AMADAN-04P-C** when the scheduler is on. When a job schedule file of the same name is received all jobs are updated with the new data, with the exception of the ACTIVE job.

Receiving a job schedule file of a different name is impossible when the job scheduler is on. The job scheduler will clear all job data when a different name **file** is received. The job data for an active job must not be cleared when the job scheduler is on.

If the job scheduler is not on, the data for all jobs is updated a job schedule file of a different file name.

THE JOB SCHEDULER OPERATION

Introduction

The job scheduler is expected to be used in both semi-manual and semi-automatic systems:

Semi Manual Systems - is when there is an operator for each stand alone punch press. The operator is responsible for loading the machine with material and tooling. The job scheduler replaces paper systems to remind the operator which parts are to be manufactured, how many parts are required, which part programs are required, what material to use, what tools to use, etc.

The operator must load material on the machine and press **cycle** start for each sheet but the job scheduler will select each part program as required. The operator must setup the machine, change tooling and change material by referring to the Part Setup page and Tool Setup page for each job when job scheduler activates them.

Semi Automatic System - is when the machine has a sheet loader (Manipulator). The loader can handle a single sheet type and the operator is responsible for keeping the sheet loader supplied. The job scheduler will control the selection of part programs to be processed while the manipulator handles the load/unload of sheets.

The operator must initiate the cycle start when the program is first selected and again if the job scheduler stops for more/another material, machine setup or tool change.

Turning on the job scheduler

The job scheduler is turned on/off using the SCHDLR ON/OFF function key. The color of the SCHDLR ON/OFF will change to magenta when the job scheduler is turned on. To turn the job scheduler on, the CNC has to be ready for operation in MEMORY mode and there must be correctly entered job schedule data. Turning on the job scheduler causes it to search the job tables for the highest priority job (priority 1 being highest) from the top of the table down. The status of the highest priority job will be set to 'ACTIVE'. The job with the next highest priority will have its status set to **"NEXT"**. The active job will start to run when the **cycle** start button is pressed.

Scheduling jobs

When the job scheduler is *first* turned on, when a job completes or when new job data is registered the job scheduler checks the priority of all jobs on the schedule to assure the highest priority job is made active.

The **job scheduler** starts scheduling jobs from the top of the list down ignoring jobs with their job status **"COMPLETE"**. **Jobs** with priority 0 or required sheets 0 are **skipped by** the job scheduler and their job status is shown as SKIPPED'. If two jobs of the same priority exist, the job nearest the top of the list will be **selected** first

The job scheduler selects the highest priority job and its job status is set to **"ACTIVE"**. The job with the next highest priority will have its status set to **"NEXT"**. (When the job scheduler is not active, the status of the highest priority job and the next higher priority job will be set to 'IN QUE'.)

If a job with a higher priority than the **"ACTIVE"** job is registered when the job scheduler is operative, its job status will be set to 'SELECTED'. When the currently 'ACTIVE' job executes an end of **cycle** command (ex. **G50**), its job status is set to SUSPEND'. The job scheduler will select the 'SELECTED' job and its job status will be set to 'ACTIVE'.

The active job will run until the sheets done is equal to the required sheets. At that point its job status will become **"COMPLETE"** and the 'NEXT' job will become the 'ACTIVE' job.

Job confirmation

When a job on the schedule which has stop flag set to Y becomes **"ACTIVE"**, the scheduler displays the message 'Job Confirm' in the Alarm Status area and the **"Machine Setup OK Y/N?"** message one line above the menu on job scheduler page. The job scheduler inhibits cycle start until the ● Y' key is pressed on the job scheduler page.

When job **confirmation** is required, the operator must check the Part Setup page and **Tool** Setup page for the "ACTIVE" job to assure proper production. Type ● Yg when all setup for the **"ACTIVE"** job is complete. Press the cycle start button to resume operation of the job scheduler.

Turning off the job scheduler

If there are no jobs to **run, the** job scheduler turns off changing the color of SCHDLR **ON/OFF** to green. The job scheduler **also** turns off when errors are found.

The job scheduler is turned off by pressing the SCHDLR ON/OFF key. If the SCHDLR ON/OFF key is pressed when a job is active, SCHDLR ON/OFF flashes to indicate that the job scheduler is going to be turned off when the current job executes an end of cycle command (ex. G50).

When the job scheduler is turned off, the status of the current job will become either 'SUSPEND' if sheets required has not been satisfied, or 'COMPLETE' if the sheets done are equal to the sheets required.

PART SETUP

PART SETUP MENU AND ITS FEATURES

When the PART SETUP function key is pressed on the main menu, the part setup for the active part program and the Part Setup local menu are displayed. The PART SETUP page can also be called from the Job Scheduler local menu, the Tool Setup focal menu and the Part Program Directory **local** menu. The active part setup page displays the part setup data for the part program selected in the CNC. This **allows** the operator to see the information associated with the job that is currently running.

ACTIVE JOB NAME : 02394		DNC Ready	
CUSTOMER NAME : AMADA CO. L.T.D.	PROGRAM NUMBER : 02011		
PART NAME : AMADA -- NO.2000_11	DUE DATE : 05/25/89		
PROGRAMMER NAME : MIKE POWELL	NEXT OPERATION : A		
CLAMP POSITION 1 : 5.000	REQUIRED PARTS : 1302		
2 : 65.000	PARTS PER SHEET : 204		
3 : 0.000	REQUIRED SHEETS : 7		
4 : 0.000			
MATERIAL SIZE X : 72.000	MULTI PART SETTING : ALL		
SIZE Y : 50.000	BLOCK DELETE : OFF		
THICKNESS : 0.030	OPTIONAL STOP : OFF		
TYPE : 848C	CLAMP TYPE : LIGHT		
	REPOSITION ON/OFF : ON		
	OVERLIDE ON/OFF : ON		
TIME ESTIMATE : 01:46:50	INCH/METRIC : INCH		
COMMENT : BEFORE STARTING THIS JOB, CHECK TOOL AND DIE. BECAUSE OF HIGH ACCURACY REQUIRED.			
HELP	JOB SCHEDLR	PART SETUP	TOOL SETUP
			PROG DIR
			NEXT
			SELECT
			SCHDLR ON/OFF

- HELP Displays part program directory in the help window
- PART SETUP Displays active part setup page.
- NEXT Displays next part setup page.
- SELECT Displays select part setup page.

PART SETUP DATA

The following data is displayed on a part setup page.

- CUSTOMER NAME** Shows a customer name or order reference: reserved for customer use.
- PART NAME** Shows a part name: reserved for customer use.
- PROGRAMMER NAME** Shows a programmer name: **reserved** for customer use.
- CLAMP POSITION** Shows initial clamp positions: operator will use for clamp setup.

MATERIAL SIZE	Shows the X/Y size of the required material: operator will use to prepare-material.
MATERIAL THICKNESS	Shows material thickness: operator will use to prepare material.
MATERIAL TYPE	Shows material type: operator will use to prepare material.
TIME ESTIMATE	Shows the estimated time to run this job: reserved for customer use.
PROGRAM NUMBER	Shows part program number .
DUE DATE	Shows due date for this job: reserved for customer use.
NEXT OPERATION	Shows the next operation code: reserved for customer use.
REQUIRED PARTS	Shows the number of parts to be manufactured: reserved for customer use.
PARTS PER SHEET	Shows the number of park that are produced on a sheet: resewed for customer use.
REQUIRED SHEETS	Shows sheets required to satisfy required parts: operator will use to prepare material.
MULTI PART SETTING	Specifies the multiple part mode: operator will use for machine operation.
BLOCK DELETE	Specifies whether-the block delete button must be turned on or off for machine operation.
OPTIONAL STOP	Specifies whether the optional stop button must be turned on or off for machine operation.
CLAMP TYPE	Specifies whether damps must be light or heavy type .
REPOSITION ON/OFF	Specifies whether the reposition on/off switch must be turned on or off for machine operation.
OVERRIDE ON/OFF	Specifies whether the override on/off switch must be turned on or off for machine operation.
INCH/METRIC	Specifies whether the part program is inch or metric units.
COMMENT	Provides a miscellaneous field for customer use.

PART SETUP HELP

When the HELP function key is pushed a list of part program numbers registered in the CNC with a 20 character comment for each program is displayed. if the part program list exceeds one page, use the PgDn/PgUp keys or cursor up/down keys to view the next/previous page. To dose the help window, press the ESC key or any function key except HELP.

DISPLAYING NEXT PART SETUP PAGE

The next part setup page is displayed by pressing the NEXT function key on the part setup **local** menu. This page displays the part setup information for the next job **specified** by the job scheduler. This page allows the operator to access information about the job that will be run next.

DISPLAYING SELECT PART SETUP PAGE

The select part setup page can be accessed by pressing **theSELECT** function key on **the** part setup local menu. This page allows the operator to choose which part program's part setup **information** to display. When this page is viewed, the data for the part program last selected by the operator is displayed. The message "Enter Program No. : **O_***" appears one line above the menu. Type a part program number and press ENTER (INPUT) to display the part setup associated with that part program. If the part program specified is not found, the message "Program Not Found" is displayed momentarily.

TOOL SETUP

TOOL SETUP MENU AND ITS FEATURES

When the TOOL SETUP function key is pressed on the main menu, the tool setup for the **active** part program and the Tool Setup local menu are displayed. The **TOOL SETUP page** can also be called from the Job Scheduler local menu, the Part Setup local menu and the Part Program Directory local menu. The active tool setup page displays the tool **setup** data for the part program selected in the CNC. This allows the operator to see the tool information associated with the job that is currently running.

ACTIVE JOB NAME : 01075				DNC Ready				
TOOL NO.	KEY	TOOL SIZE	TOOL TYPE	DIAMETER OR SIZE X	SIZE Y	ANGLE	RADIUS	DIE CLEAR
T203		A	RO	0.080	0.000	0.00	0.00	0.000
T212		A	RO	0.120	0.000	0.00	0.00	0.000
T206		A	RO	0.240	0.000	0.00	0.00	0.000
T333	K	B	RO	1.180	0.000	0.00	0.00	0.000
T306	K	B	SO	0.800	0.000	0.00	0.00	0.000
T256	K	B	RE	1.180	1.970	0.00	0.00	0.000
T228	K	C	RO	0.440	0.000	0.00	0.00	0.000
T210	K	C	RE	1.970	1.970	90.00	0.00	0.000
T201	K	E	RE	3.350	1.970	0.00	0.00	0.000

To get more information. Push page key

HELP	JOB SCHEDLR	PART SETUP	TOOL SETUP	PROG DIR	NEXT	SELECT		SCHEDLR ON/OFF
------	-------------	------------	------------	----------	------	--------	--	----------------

- HELP Displays part program directory in the help window.
- TOOL SETUP Displays active tool setup page.
- NEXT Displays next tool setup page.
- SELECT Displays select tool setup page.

TOOL SETUP DATA

The **following** data is displayed on a tool setup page.

- TOOL NO.** Shows the **turret** station number.
- KEY** Will contain a K if the station is a keyed station.
- TOOL SIZE** Shows *the* station size. A through F.
 - A size - 1/2"
 - B size - 1-1/4"
 - C size - 2"
 - D size - 3-1/2"
 - E size - 4-1/2"
 - F size - 6"

TOOL TYPE Shows the code specifying the tool shape.

RO - Round
SQ - Square
RE - Rectangle
08 - Obround
SD - Single D
DD - Double D
RC - Rounded Rectangle
TR - Triangle
CR - Comer Radius
CP - Center Punch

DIAMETER OR SIZE X Shows the tool diameter or the X direction tool size.

SIZE 7 Shows the Y direction tool size.

ANGLE Shows the tool angle from the key.

RADIUS Shows the radius size for rounded comers or cut-out comers

DIE CLEAR Shows the clearance between punch and die.

TOOL SETUP HELP

When the **HELP function key** is pushed a list of part program numbers registered in the CNC with a **20** character comment for each program is displayed. If the part program list exceeds one page, use the PgDn/PgUp keys or **cursor** up/down keys to view the next/previous page. To dose the help window, press the ESC key or any function key except HELP.

DISPLAYING NEXT TOOL SETUP PAGE

The next tool setup page is displayed by pressing the **NEXT function key** on the tool setup local menu. This page displays the tool setup information for the next job specified by the job scheduler. This page allows the operator to access information about the job that will be run next.

DISPLAYING SELECT TOOL SETUP PAGE

The select tool setup page can be accessed by pressing the **SELECT function key** on the tool setup local menu. This page allows the operator to choose which part program's tool setup information to display. When this page is viewed, the data for the part program last selected by the operator is displayed. The message 'Enter Program No. : O_' appears one line above the menu. Type a part program number and press ENTER (INPUT) to display the tool setup associated with that part program. If the part program specified is not found, the message 'Program Not Found' is displayed momentarily.

PART PROGRAM DIRECTORY

PART PROGRAM DIRECTORY MENU AND ITS FEATURES

When PROG DIR function key is pressed on the main menu, the Part Program Directory page and its menu are displayed. The PART PROGRAM DIRECTORY also can be called from the Job Scheduler menu, Part Setup menu or Tool Setup menu.

PROGRAM NO.	COMMENT	DNC Ready	
		CHAR	FEET
01001	TOOL BDK - PART NO.1	132	2
01002	TOOL BDK - PART NO.2	256	3
01003	TOOL BDK - PART NO.3	312	3
01004	TOOL BDK - PART NO.4	1023	9
01005	TOOL BDK - PART NO.5	284	3
01006	TOOL BDK - PART NO.6	574	9
02011	ANABA -- PART NO.2000_11	162	2
02012	ANABA -- PART NO.2000_12	2068	25
02013	ANABA -- PART NO.2000_13	739	7
02014	ANABA -- PART NO.2000_14	92	1
02015	ANABA -- PART NO.2000_15	1730	15
02016	ANABA -- PART NO.2000_16	3824	32
02017	ANABA -- PART NO.2000_17	245	3
02018	ANABA -- PART NO.2000_18	841	8
02019	ANABA -- PART NO.2000_19	178	2
02020	ANABA -- PART NO.2000_20	137	2
02021	ANABA -- PART NO.2000_21	1839	16
02022	ANABA -- PART NO.2000_22	1233	11

FILES : 36 MEMORY REMAINING : 10445 68
 NO. OF PROGRAM REMAINING : 39

HELP	JOB SCHEDLR	PART SETUP	TOOL SETUP	PROG DIR	SEARCH	SELECT	DELETE	SCHDLR OR/OFF
------	-------------	------------	------------	----------	--------	--------	--------	---------------

- HELP Displays help window.
- PROG DIR Displays a list of part programs registered in the CNC.
- S E A R C H Searches for a specified program number in the directory.
- SELECT Select a part program to make the active CNC program.
- DELETE Delete a part program from the CNC.

PART PROGRAM INFORMATION

The following information is displayed on the part program directory page.

- PROGRAM NO.** Shows the four digit part program number used for program ID by the CNC. Up to 95 programs can be registered in the CNC.
- PROGRAM COMMENT** Displays a comment up to 48 characters in length. The comment must appear in the same line as the program number ("O block).

CHAR SIZE	Shows the program size in characters.
FEET SIZE	Shows the program size in feet of paper tape .
FILES	Shows the number of the part programs stored in the CNC.
MEMORY REMAINING	Shows the remaining part program storage in the CNC in both character size and feet site.
NO. OF PROGRAM REMAINING	Shows how many additional programs can be registered in the CNC.

The **active** CNC part program is displayed in reverse video.

PART PROGRAM DIRECTORY HELP

When the HELP function key is pressed, operational help for the part program directory page is displayed. To close the help window, press the ESC key or any function key except HELP.

SEARCHING FOR A PROGRAM NUMBER

When the **SEARCH** function key is pushed, the message 'Enter Program No. : O_-' is displayed one line above the menu.

Type a part program number and press ENTER (INPUT).

When the specified program number is found, it is displayed at the top of the directory and the cursor is positioned at this program number. If the specified program number **is** not found, the message 'Program Not **Found**' is displayed **one** line above the menu momentarily.

SELECTING A PART PROGRAM

The program number indicated by the cursor position will become the active CNC program when the SELECT function key is pressed. When a program is selected, the message 'File is selected' appears one line above the menu and the selected part program changes to reverse video display.

To specify which program to select, use the SEARCH function or move the cursor by pressing the **cursor** up/down keys or the page up/down keys.

This function does not work when the CNC is in operation (machine is working) or while editing a program. The CNC must be in either MEMORY or, EDIT mode. The message 'Select Error' is displayed one line above the menu when no program is selected in the CNC.

DELETING A PART PROGRAM

When the DELETE function key is pressed, the program indicated by the cursor position becomes magenta and the message 'Are you sure (Y/N)' is displayed one line above the menu.

To delete the program:

press the Y key.

To cancel the DELETE function:

press any key except the Y key.

When the DELETE function has executed, the message 'File is deleted' appears one line above the menu and the program no longer appears in the directory. Otherwise, the message 'Delete **error**' is displayed. To specify which program to delete, use the SEARCH function or move the cursor by pressing the cursor up/down keys or the page up/down keys.

CHAPTER IV

PART PROGRAM EDITOR

The part program editor has &most all of the same features as U.S. **Amada's AMPUNCH_1 E** editor. If you are already familiar with **AMPUNCH_1 E**, it will be very easy to use the part program editor.

Since the part program editor can be run while the machine is punching, you can prepare the next part program without stopping the machine.

This chapter is constructed as below :

EDITOR GENERAL INFORMATION

EDITOR CONFIGURATION FUNCTIONS

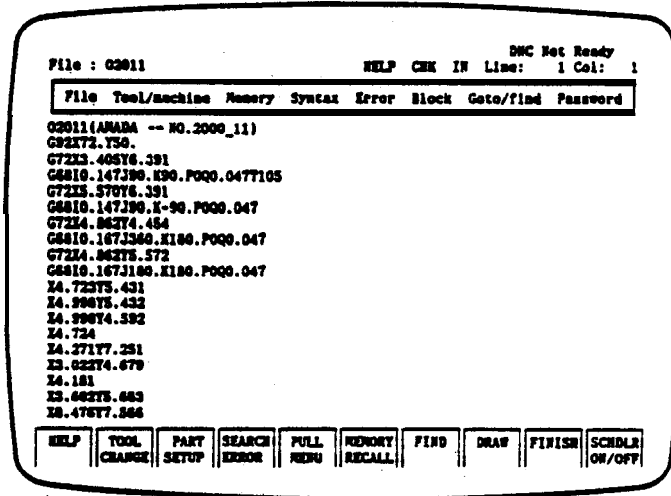
EDITOR PROGRAMMING AIDS

EDITOR WORDPROCESSING FUNCTIONS

EDITOR FILE MANAGEMENT FUNCTIONS

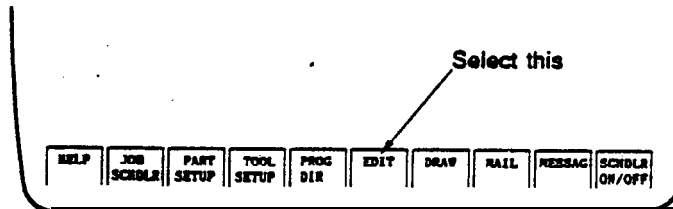
EDITOR GENERAL INFORMATION

This section describes how the editor is operated, the organization and use of the editing display elements, the tasks that should be completed before part program statements are entered, the general procedures for creating and viewing part program statements and the techniques for selecting functions.



STARTING UP THE EDITOR

From Main Menu:



The editor will display the Password Input page if a password has been specified or display the Program Select page if a password has not been registered.

Password Input

The Password Input page requires that the operator enter the correct password before using the editor. If the wrong password is entered three times, the editor returns to the main menu. If the correct password is entered, the editor proceeds to the Program Select page.

Password : _

The password function should be used to protect the part programs from editing by **unauthorized** persons. The password can be specified or changed using the Password function which will be explained in **"EDITOR PROGRAMMING AIDS"** on CHAPTER IV.

IMPORTANT: The Password Input page cannot be passed if a password has been registered once.

Program select

If a password has not been specified, the editor goes directly to the Program Select page when the EDIT function is selected from the main menu. The Program Select page displays a G-code program directory. From here, the operator may select from the following choices:

- Create a new part program.
- Edit an existing part program.
- Resume a previous edit.

```
File :                               DNC Not Ready
                                HELP  OK  IN  Line:  1  Col:  1
-----|-----|-----|-----|-----|-----|-----|-----|
| File | Tool/machine | Memory | Syntax | Error | Block | Goto/find | Password |
|-----|-----|-----|-----|-----|-----|-----|-----|
|                                     GCODE EDITOR                                     |
| NO.  | COMMENT      | NO.  | COMMENT      |
| 01001 | TOOL BOX - PART NO.1 | 01002 | TOOL BOX - PART NO.2 |
| 01003 | TOOL BOX - PART NO.3 | 01004 | TOOL BOX - PART NO.4 |
| 01005 | TOOL BOX - PART NO.5 | 01006 | TOOL BOX - PART NO.6 |
| 02011 | APADA -- NO.2000_11 | 02012 | APADA -- NO.2000_12 |
| 02013 | APADA -- NO.2000_13 | 02014 | APADA -- NO.2000_14 |
| 02015 | APADA -- NO.2000_15 | 02016 | APADA -- NO.2000_16 |
| 02017 | APADA -- NO.2000_17 | 02018 | APADA -- NO.2000_18 |
| 02019 | APADA -- NO.2000_19 | 02020 | APADA -- NO.2000_20 |
| 02021 | APADA -- NO.2000_21 | 02022 | APADA -- NO.2000_22 |
| 02023 | APADA -- NO.2000_23 | 02024 | APADA -- NO.2000_24 |
| 06001 | MARIYA        | 06002 | AKIWA        |
|-----|-----|-----|-----|-----|-----|-----|
| Enter Program Number or Use Cursor Key to Select :0 |
|-----|-----|-----|-----|-----|-----|-----|
| HELP | TOOL CHANGE | PART SETUP | SEARCH ERROR | PULL MENU | MEMORY RECALL | FIND | DRAW | FINISH | SCHEDL ON/OFF |
```

Creating a new part program

To initialize the editor work space for a new G-code program, type a new program number and press the ENTER key. If the program number does not already exist in the CNC, the editor will confirm that it is creating a new program with the message:

File is new, do you wish to continue? (Y/N)

Press Y for yes. Type N for no.

Editing an existing part program

To retrieve a program stored in the CNC that you wish to edit, type its program number or press the cursor keys or the page keys so the desired program number appears in reverse video, and then press the ENTER key. If the program number is found in the CNC, the editor will confirm with the following message:

Reading the file. Please wait.

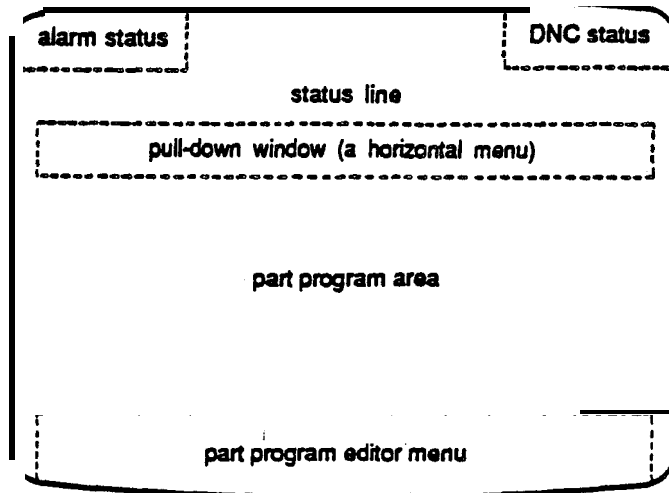
— **The** editing screen appears **displaying** the first page of the program.

Resuming a previous edit

Even if the **system has** been powered down since the **last** editing session, the previously edited program can be recalled without typing its program number. When the Program Select page is displayed the cursor will be positioned at the program edited last. Just press ENTER to resume editing this program.

EDITOR DISPLAY FORMAT

The figure below illustrates the editing screen as it appears just after selecting a part program.



Alarm status

When a CNC error occurs, the CNC alarm number will be displayed.

DNC status

'DNC Not Ready' is displayed when the part **program** editor is active.

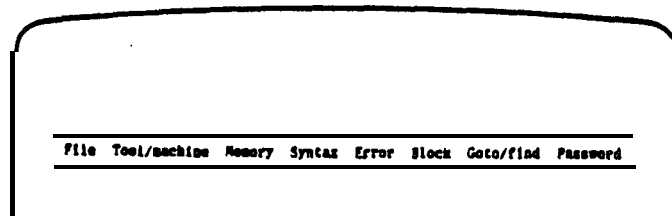
Status line

While a program is being edited, the status line maintains:

- The part program number
- 'Up to 3 indicators (HELP, CHK and IN) that **indicate** which of the optional edit features are currently enabled
- **The** current location (line and column) of the cursor

Pull-down window

The pull-down window contains a menu of eight functions listed horizontally **across** the window. The pull-down window is activated by pressing the PULL MENU (**F5**) function key on the part program editor menu which places a **highlight** bar inside the window.



Once the highlight bar is inside the window, you may either type the first letter of the desired function (for example, type **E** to select the Error function), or use the right and left cursor keys to position the highlight bar on the desired function and press ENTER. A sub-menu corresponding to the function selected appears in the program area. The individual functions are described in later sections. All sub-menus that appear in the program area of the editing screen are removed by pressing the ESC key. Any portion of the G-code statements that were temporarily blocked from view will **be** restored to the display.

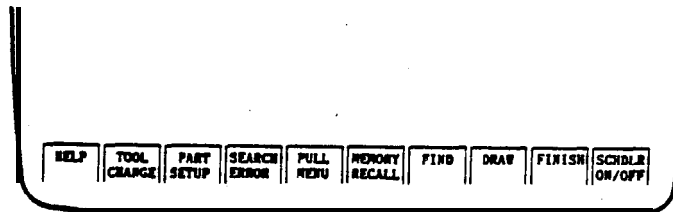
File	Tool/machine	Memory	Syntax	Error	Block	Goto/find	Password
Finish Save & Quit Merge Dir	Tool change Offset change Used tool line	Store Recall	Whole On lin	Error Next	Begin End Copy Move Delet Hidden/s	Top of file End of file Line Column Find Find/Replace Next	

Part program area

The part program selected on the Program Select page is displayed in this area. Columns 1 through 80 may be used for one program statement (an **instruction**). The instruction portion of part program statements typically begins in column 1, however, programmer comments may be typed in front of instructions as well as after them. Comments are always enclosed in parentheses ().

Part program editor menu

The bottom line of the display shows the part program editor menu. Most of the functions listed in the part program menu (except HELP, PART SETUP, **PULL MENU** and **DRAW**) **are duplicated** in the pull-down menu.



Function keys become inoperable when pull-down windows are active. The individual functions are described in later sections.

NOTE: On the Password Input page or the Program Select page, the part program editor menu **is inoperable**. When the main menu is displayed it is operable.

Status line indicators

There are three optional editor features that may be enabled and disabled during the editing of a part program. When one of these features is enabled, an indicator representing that feature appears on the status line.

- HELP** Online Help. When Online Help is on, the parameters required for a **G** or **M** function will be displayed in a small window as soon as you type the last digit of the **G** or **M** function into a program statement.
- CHK** Online Error **Check**. When Online Error Check is on, program statements are checked for syntax errors as they are entered or modified.
- I N** Insert Mode. When insert Mode is on, any character you type will cause all characters from the insert position to the end of the line to shift right one column. When Insert Mode is off, Overtyping Mode is on and any characters typed will replace those at the current cursor position.

The use of these optional features is described in other sections of this chapter. The editor remembers the state (enabled or disabled) of the HELP, CHK and IN features when a **file** is saved, and restores them to their save-time state when the next part program is selected.

Line number and column number

Line numbering begins with line 1 and increments by one for each statement. When statements are deleted, inserted or merged from another file, line numbers are automatically and immediately adjusted to reflect the new sequence of statements. The line number which the cursor is in always appears on the status line. It is updated whenever a key is pressed or a text block operation is completed.

Columns 1 through 80 may be used for a program statement (an instruction). The **column** number on which the cursor is located always appears on the status line and is updated whenever a character is typed or deleted, or when the cursor is moved left or right on a line.

PROGRAM CONFIGURATION

Three configuration tasks must be performed in conjunction with every G-code program.

- [1] The tool configuration must be defined.
- [2] The sheet and simulation parameters must be specified.
- [3] The optional editing features (Online Check, Editing **Mode** and Online Help) should be set to match your requirements.

It is recommended that all three of these tasks be performed before G-code statements are entered.

Tool configuration

The TOOL CHANGE function (F2) is used to change tool definitions in the program's working copy TOOL PAGE. Study the information about tool configuration in later sections.

Sheet and simulation parameter: part setup

Sheet size and other parameters that are used by the graphics processor are specified on the PART SETUP PAGE. The PART SETUP PAGE should be filled in before the graphics processor is invoked by the DRAW function key. Otherwise, the graphics processor will cause various problems. The editor is **used** to fill in the PART SETUP PAGE. See later sections.

ENTERING PART PROGRAM STATEMENTS

The editor's full wordprocessing capabilities are available for entering program statements. As a full-screen editor, the editor permits the cursor to be moved anywhere within the display to enter or modify statements. Lines may be inserted and deleted. A block of statements can be moved or copied to new locations within a program. A full set of **wordprocessing** functions exist to facilitate rapid cursor branching, text **searches**, global text replacements and other operations. Refer to Basic Editing Functions **section**.

Placing comments in part program statements

Text comments may be included **with** the program statements for information purposes. Comments are ignored by syntax check and the graphics processor. All data included within parentheses **()** is considered a comment. Comments may be **placed** in the same line as a **G-code** instruction or alone on a line.

Comments on the same line as a G-code instruction may appear before or after the instruction portion of the statement. There must be at least one space separating the instruction and the adjacent parenthesis. Comments that require more than one line must have two parentheses on every line. When Block Delete is enabled (see part setup page), any line with a slash **(/)** in column 1 will be treated as a comment and not processed.

Statement numbers

Statement numbers (N with up to 4 digits) are optionally entered by **the** programmer. They are valid *on* all statements. When used, they are the **first** field of the **G-code** instruction. Statement numbers are neither **resequenced** nor processed by the editor.

Concluding an edit

There are several ways to conclude an edit, with or without saving the changes, with or **without** removing the current statements from view. Refer to EDITOR FILE MANAGEMENT FUNCTIONS on page **4-41**.

SELECTION TECHNIQUES

The editor presents a contemporary **interface** to the user. The primary elements of dialog are menus, function keys, dynamically-constructed lists and **quick** reference windows that are displayed and removed at **the user's** request. These elements:

- **Minimize** the number of keystrokes required to perform a task.
- Reduce the potential for making typing mistakes.
- Totally eliminate the need for memorizing the names of commands, **options**, **program** numbers, etc.

As the user directs the system to accomplish tasks, the commands that are applicable to each step and the use of function keys at each **step** are documented on the **display**.

Moving the highlight bar

Whenever a menu is in active, one of the choices will be highlighted. **To select the highlighted** choice, press the ENTER key. You may **move the highlight bar** using the cursor up and cursor down keys or, in the case of horizontal menus, the left and **right** cursor keys. Some functions display more **than one menu at a time** but **only** the menu containing the cursor (**highlight bar**) is effective.

Typing the command letter

It is not necessary to use the highlight bar to choose an entry from a menu. Observe that the first letter of each entry is unique from **all** other entries. This **letter** is often called the command letter. Typing the command letter will accomplish the same thing as moving **the** highlight bar and pressing ENTER.

Dynamic lists

The choices *on* a given menu are the same each time the menu is called; that is, the entries are "**hard-coded**". Dynamic lists appear similar to menus, but the entries are composed online. For example, when the user must select the program **number** on **the** Program **Select** page, a **list** of all **such** files is presented on the display. The highlight bar **selection** technique described above applies to lists. Since a **list** may contain more than a few entries, lists may **be** scrolled. Use **the** PgDn/PgUp **keys to view the next/previous** page of **long** lists.

Function keys

The usage of function keys **F1** through **F10** changes during different steps of a task. Short **labels** indicating what functions **are** associated with **the** keys **are** maintained on the bottom line of the display. For example; **HELP** is a reminder that the **F1** key invokes the HELP function.

ESC key

In all **cases** where making a choice leads to another menu of **choices**, you may **return to the** previous display by pressing **the** ESC key.

EDITOR CONFIGURATION FUNCTIONS

This section describes the editor functions that **are used** to define **the physical environment** in which a part program will operate (Tool **function** and Part Setup function).

TOOL AND MACHINE CONFIGURATION

The Tool/machine pull-down menu and **the** TOOL CHANGE function key permit **the** programmer to:

- See a list of the tools **used** in **the** part program.
- **Modify the current turret tool load.**

The first paragraphs of this **section** describe **the elements** of machine Configuration and how part programs and their **components are** inter-related. **The** later paragraphs describe how to **US8 the tool functions to perform configuration** tasks.

Machine parameter files (MPF)

There are two Machine Parameter Files that are **used** by a program to define the program's operating configuration. One **is** **METR.MP** for metric unit programs, **the** other is **INCH.MP** for inch unit programs: **The** configuration data includes **the** machine's parameters **such** as machine **size**, nibble pitch, **turret type**, etc. These Machine **Parameter** Files **are** configured automatically from CNC parameters **when the MMC system software is powered** up.

Working copy editor parameter file (EDITOR.PR)

The term 'working copy Editor Parameter File' **refers** to the Copy Of **the** **associated** MPF (inch or metric) , part setup data and tool data that reside in memory while **the** program is **being** edited. The part setup data can **be** modified using **the** PART SETUP function. The tool data can **be modified** using **the** TOOL CHANGE function. They **are saved** with the program whenever **the** program is **saved**.

Machine parameter – is configured automatically

Part setup data – must **be** specified in PART SETUP PAGE

Tool data – must be defined in TOOL PAGE

There are two ways to position the cursor at the station line to be modified:

Move the highlight bar using the up/down arrows and then press ENTER.
(PgDn/PgUp for the next/previous 10 tools.)

Type the station number and press ENTER.

After specifying a station number, update windows appear to solicit data for each individual field:

Type = When the update window appears for tool type, use a function key or type the two abbreviation to specify the tool shape. The tool shapes represented by each of the function keys are shown on the next page. The tool type selected will determine which of the other fields are required. Update windows appear only for required fields.

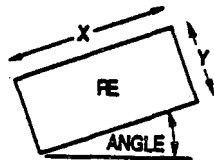
Tool-X = The dimension specified by the X-SIZE field varies depending on the tool type. Refer to the illustrations on the next page to determine which dimension is represented by X-SIZE (|←X→|).

Tool-Y = The dimension specified by the Y-SIZE field varies depending on the tool type. Refer to the **illustrations** on the next page to determine which dimension is represented by Y-SIZE (|←Y→|).

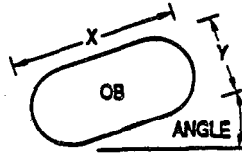
Angle = Refer to the illustrations on the next page to determine which angle must be specified.

Radius = Refer to the illustrations on the next page to determine which radius must be specified.

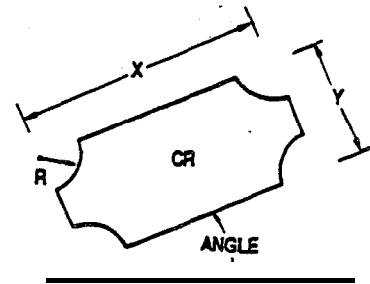
Die Clear = Die clearance.



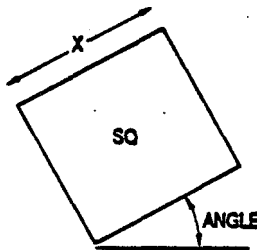
RECTANGLE



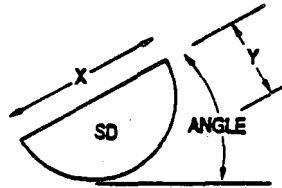
OBROUND



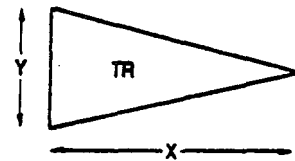
CORNER RADIUS
 $R < 1/2 X$
 $R < 1/2 Y$



SQUARE



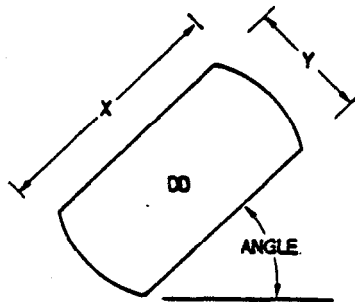
SINGLE D
 $X > Y$



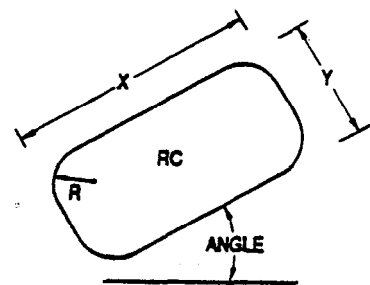
TRIANGLE



ROUND



DOUBLE D
 $X > Y$



ROUNDED RECTANGLE
 $R < 1/2 X$
 $R < 1/2 Y$

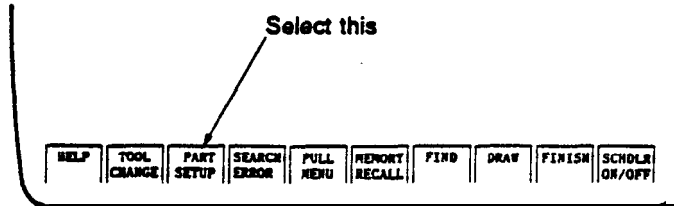
TOOL TYPES AND REQUIRED DIMENSIONS

Note: The CP (Center Punch) tool appears as a small dot on drawings. A center punch requires no parameters when configured in a turret station.

SIMULATION PARAMETER PART SETUP

All the parameters that effect the **drawing** and validation of your part design (other than the machine and tool definitions themselves) are defined on the PART SETUP PAGE. **These** parameters define sheet **characteristics** and **drawing options**. The PART SETUP PAGE also define text for the **operator's** information.

Part setup function key



The full PART SETUP PAGE appears for updating whenever the PART SETUP function key is pressed. When finished with the page, press ESC.

```

BMC Not Ready

CUSTOMER NAME : AMADA CO. L.T.D.          PROGRAM NUMBER : 02011
PART NAME     : AMADA -- NO.2000_11      DUE DATE       : 05/21/90
PROGRAMMER NAME : MIKE POWELL           NEXT OPERATION  : A

CLAMP POSITION 1 : 5.000                   REQUIRED PARTS   : 1302
                2 : 65.000                PARTS PER SHEET : 204
                3 : 0.000                   REQUIRED SHEETS  : 7
                4 : 0.000

MATERIAL SIZE X : 72.000                 MULTI PART SETTING : ALL
SIZE Y          : 50.000                 BLOCK DELETE       : OFF
THICKNESS       : 0.030                 OPTIONAL STOP      : OFF
TYPE            : S45C                   CLAMP TYPE         : LIGHT
TIME ESTIMATE   : 01:48:50              REPOSITION ON/OFF  : ON
                                           OVERRIDE ON/OFF    : ON
                                           INCH/METRIC        : INCH

COMMENT : BEFORE STARTING THIS JOB, CHECK TOOL AND
          DIE. BECAUSE OF HIGH ACCURACY REQUIRED.

HELP  TOOL  PART  SEARCH  PULL  MEMORY  FIND  DRAW  FINISH  SCHDLR
CHANGE SETUP ERROR MENU RECALL          ON/OFF

```

Default part setup page field values

When the editor **workspace** is initialized for the creation of a new program, default values are set in those fields that must be defined for the graphics processor to draw and simulate your program.

Required updates

The default values of the following PART SETUP PAGE fields must be updated to reflect the correct specifications for your program or the graphics processor will not be able to verify that the program will run without error on the target machine:

- Material size X and Y
- Clamp positions (initial positions)
- Inch/Metric** (must match measurement system used in the part program statements)
- Block delete
- Multi part setting

All other fields may be updated for the operator to reference when setting up the machine and preparing the material for the job.

Modifying field

Moving the cursor with the cursor up and down keys. Type the new/corrected value in the field and press the ENTER key. A field **is** not updated until a valid value is entered, If an incorrect value is entered, an **error** message appears, and the data must be re-entered. To correct typing mistakes, use the Backspace key to erase characters and then retype the correct data. The PART **SETUP** PAGE may be displayed and modified at any time and as often as required.

Field formats and legal values

The following table describes the legal formats and values for PART SETUP PAGE data.

Name of field	Format / legal values
Customer name	up to 20 characters
Part name	up to 20 characters
Programmer name	up to 20 characters
Clamp positions	0 to max. x direction table size
Material size	0 to 999999.99 in metric, 0 to 99999.999 in inch
Material thickness	0 to 999999.99 in metric, 0 to 99999.999 in inch
Material type	up to 6 characters
Time estimate	hh:mm:ss (hh: 0 – 99, mm: 0 – 59, ss: 0 – 59)
Program number	can not be changed
Due date	mm/dd/yy (up to 6 characters)
Next operation	a character
Required parts	0 to 999999
Parts per sheet	0 to 999999
Required sheets	calculated by the part setup editor
Multi part setting	toggled to None, First , Others, All or Fourth
Block delete	toggled to On or Off
Optional stop	toggled to On or Off
Clamp type	toggled to Light or Heavy
Reposition On/Off	toggled to On or Off
Override On/Off	toggled to On or Off
Inch/Metric	toggled to Inch or Metric
Comment	up to 80 characters

Use of fields

The Inch/Metric field specifies the measurement system that is used. INCH = Inch System. METRIC = Metric System. This field is used by both the editor and the graphics processor. It designates the measurement system in:

- The part program statements
- The Machine Parameter File
- The other PART SETUP page fields and TOOL page
- The graphics functions. coordinate prompts and messages

(NOTE) The Inch/Metric change actually occurs when the programmer leaves the PART SETUP **PAGE**.

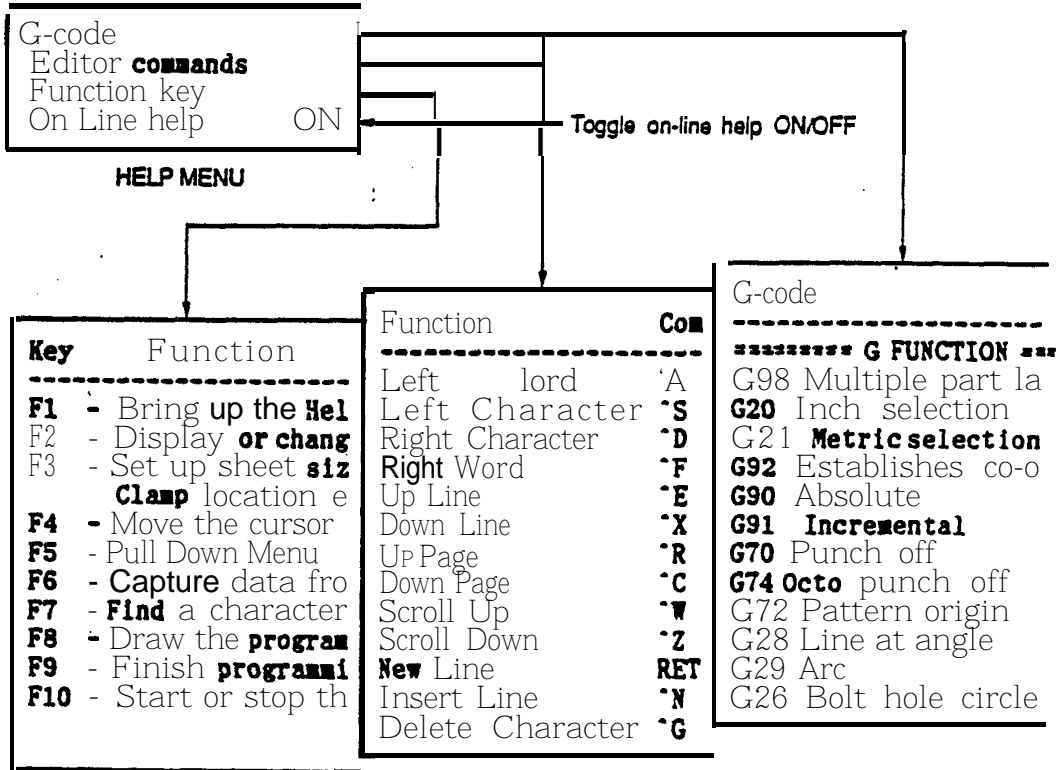
The use of other fields are described in PART SETUP on Chapter III and the section "Use of PART SETUP PAGE parameters in graphics processing" on Chapter V.

Saving the **part** setup page

The PART SETUP PAGE is saved automatically whenever the G-code program is saved. See later on page 4-41, "What gets saved".

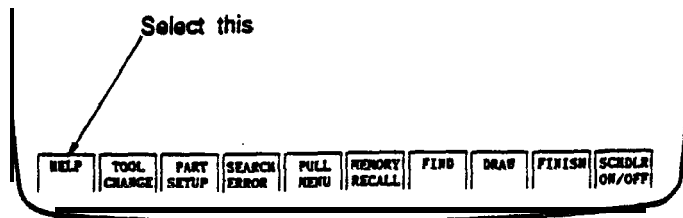
EDITOR PROGRAMMING AIDS

This section describes the editor's 'intelligent programming' functions. These functions are used to define the legal values for part program statement fields, to verify statement syntax and facilitate error corrections (G-code help functions, Syntax checking functions, Error handling functions, Memory functions, password function).

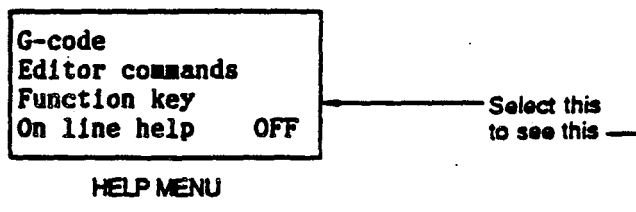


FUNCTION KEY HELP WINDOW

The function key help window explains the use of the function keys.



Press the **HELP** function key (**F1**) to display the help menu window and select **"Function key"** in the help menu:



Key	Function
F1	- Bring up the Help Menu.
F2	- Display or change tools.
F3	- Set up Sheet size. Clamp location etc.
F4	- Move the cursor to next error.
F5	- Pull Down Menu.
F6	- Capture data from Memory pad.
F7	- Find characters in the program.
F8	- Draw the program to the screen.
F9	- Finish programming.
F10	- Start or stop the Job scheduler.

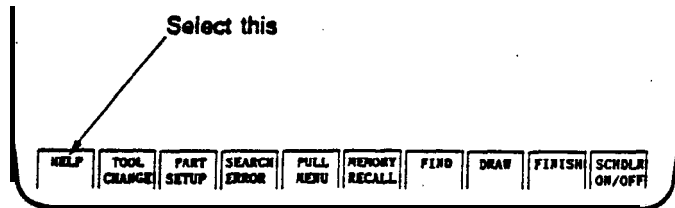
Press the **ESC** key to remove each window.

G-CODE REFERENCE WINDOWS

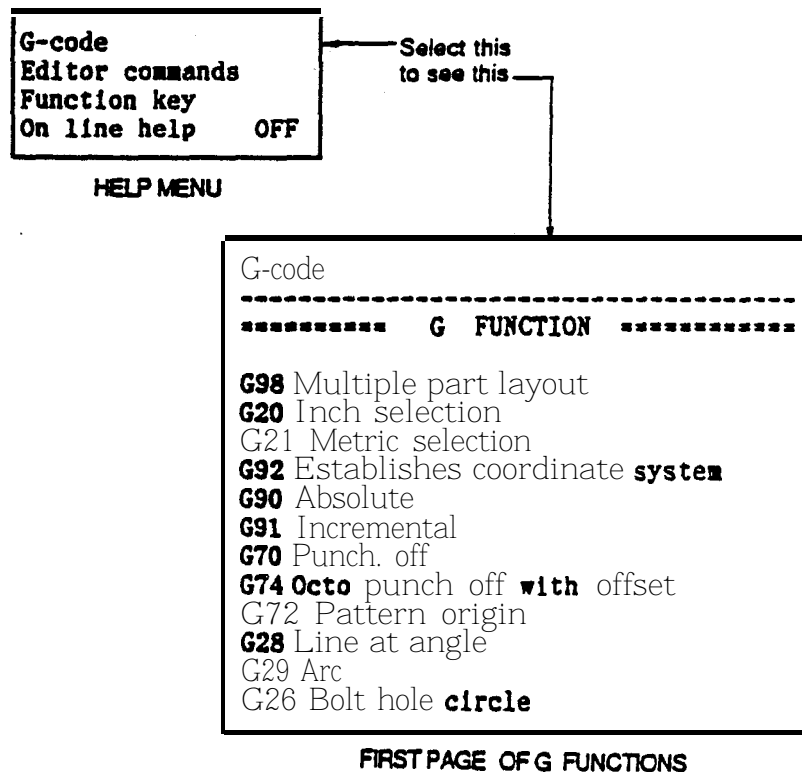
The part program editor has two G-code help functions:

- G-code function help window.
- On-line help: G-code pop up windows.

Window of G-code functions



Press the HELP function key (Ff) to display the help menu window and select S-code' in the help menu:

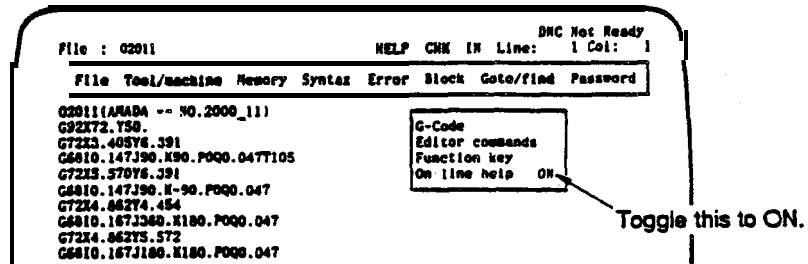


Use PgDn/PgUp key to display next/previous page.

Press the ESC key to remove each window.

G-code parameter windows

If On-line Help is enabled, a window appears whenever a G-code function (for example, G66) is typed into a program statement. The window defines all the parameters for that **G-code**. Parameter windows remain in view until the next G-code is entered or ENTER is pressed. To enable On-line Help, press the HELP function key (**F1**) to display the help menu and then:



Below are a few of the parameter windows that appear.

100 Program Stop	G66 Shear Proof Slotting I(Length +-) J(Angle +-) P(Punch Length +-) Q(Punch Width +-) D(D Adjust +-) K(Window Length)
M80 Work Chute Open	
G50 Return Reference Point & Program End	G26 Bolt Hole Circles I(Radius) J(Starting Angle +-) K(# of Roles +-)
G70 Punch Off	

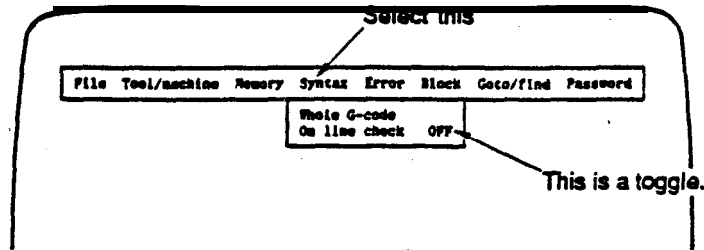
SYNTAX CHECKING

The editor **will** perform syntax checking on the entire part program upon request. Once the check has been performed, the program buffer is prepared for use with the error handling features described later in this Section. The editor will also perform syntax checking on one statement at a time when the Online Check feature is enabled.

(NOTE) Syntax checking on the entire program is performed when the FINISH file function is initiated.

Syntax check menu

Selecting "Syntax" from the pull-down window displays the menu of syntax check functions.



Press the ESC key to remove the menu.

Whole program check

When the whole program is checked for syntax errors, statements with **errors** are flagged internally in the program buffer. Following the check, the status line shows an **error** description of the **first** error statement and the cursor is positioned on the **first** statement with an **error**. Refer to 'Error Handling' for a description of error listing and error-stepping features.

Online checking

When Online Check is toggled to ON, the ENTER key will activate a syntax check of the current line. If an **error** is detected, the cause is displayed on the status line and the cursor is inhibited from moving to another line. After correcting the **error**, press ENTER again to free the cursor. If the error is not corrected, the cursor may be freed, by typing a cursor up or down key.

ERROR HANDLING

Error handling provides for displaying any statements that contain error flags and for stepping from the current cursor location to the next error-flagged statement. Using **error** stepping, the programmer can correct a statement then skip to the next statement **with** errors without performing any other cursor movement commands.

Two kinds of errors are flagged:

- Syntax errors
- Detected design errors

Syntax errors

Syntax errors are errors in statement format or content that can be detected in an isolated statement. Syntax errors include such things as a missing parameter, an unidentified field, a value that is out of the **acceptable** range of legal values for the parameter, use of a tool that is **not** defined in the working copy **EDITOR.PR**, and so forth.

Design errors

Design errors are errors related to the sequence of a statement and its validity based on operations that were performed by previous statements. Design errors include such things as: punching in a **location** that conflicts with the current **location** of a damp, auto-repositioning the damp while nibbling, etc. Potential design errors (warnings) include traveling beyond a sheet boundary, which in some cases-is a deliberate and necessary operation for the part.

Buffer error-flagging

Statements containing errors or warning conditions are flagged internally in anticipation of subsequent error handling.

Syntax error detection

Syntax errors are detected by the editor and during preliminary processing of the graphics **processor's "first draw"** (see Chapter V). The editor will flag statements with errors after the user has selected one of the two syntax check commands (see Syntax Checking?). For **"first draws"** errors are flagged automatically. It is not necessary to perform a syntax check before invoking the graphics processor.

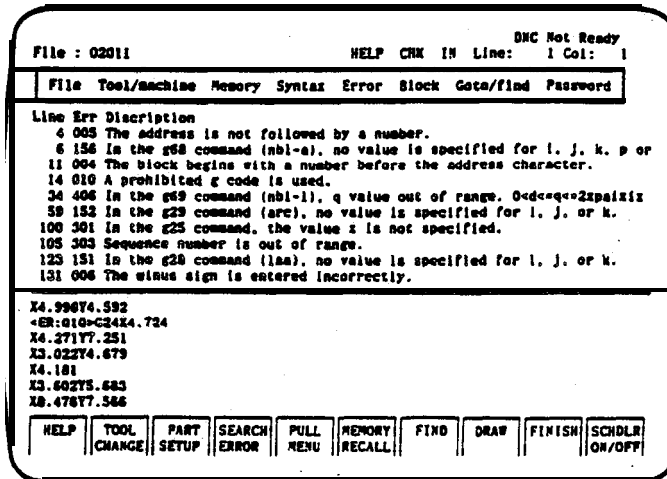
Design error detection

Design errors are detected by the graphics processor. Statement flagging **occurs** automatically for **all** design **errors** and warning conditions detected **by the graphics** processor.

Non-detectable design errors

Some design errors can only be detected by watching the visual simulation of sheet and machine operations. For example, a workholder being positioned on a cutout.

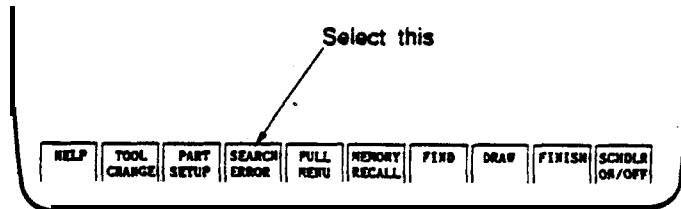
For example:



Press the ESC key to remove error list..

Go to next, error : Positions the cursor at the next statement with an error-flag.
The flag may **be** for a syntax **error** or a design warning.

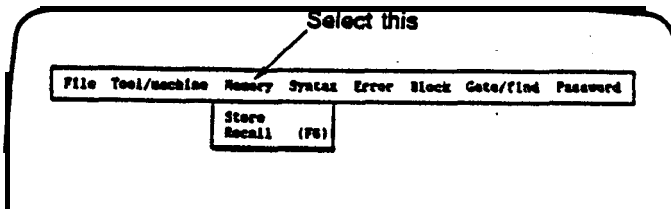
Search error function key



The SEARCH ERROR function key performs the same function as the 'Go to next error' function of the Error menu.

MEMORY FUNCTIONS

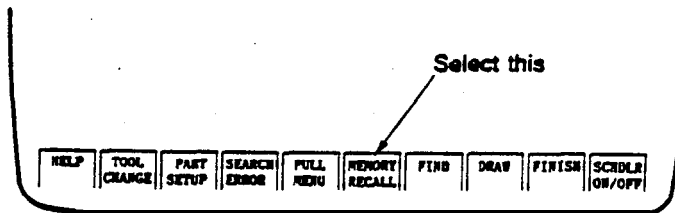
The memory function is a **memory pad** for storing/recalling frequently used values. Selecting Memory from the pull-down **window** displays the menu of memory functions:



Store: Update **values** in the memory pad.

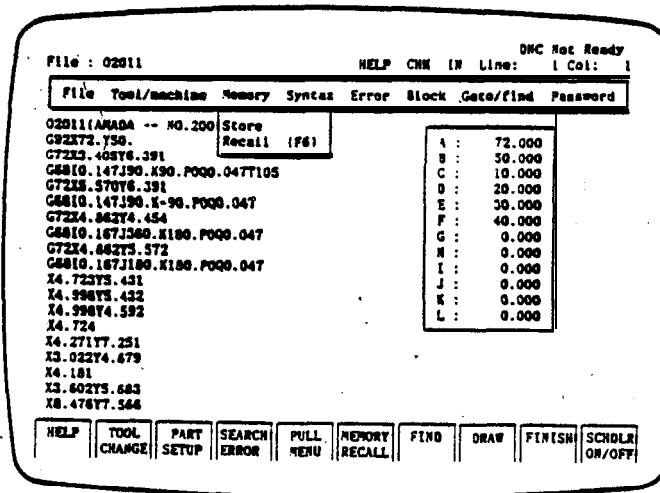
Recall: Copies values from the memory pad to the **current** cursor position.

The MEMORY RECAU function key performs the same function as the Recall **function** of the Memory menu:



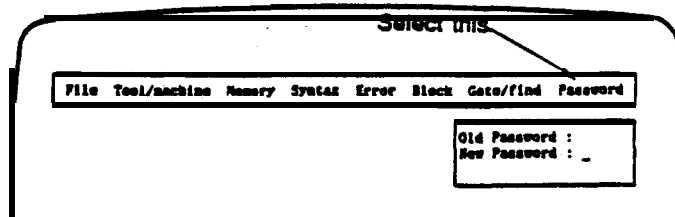
Memory pad

Selecting the memory function displays **the** memory pad as below. Press **the** ESC key to remove it from view. **The** memory pad contains 12 slots A through L



PASSWORD FUNCTIONS

The password function is used to protect part programs from editing by unauthorized persons. (See 'Password **Input**' on page 4-3.) Selecting Password from the pull-down window displays the change password window:



Press the ESC key to cancel the password function.

Registering the password

When no password has been **previously** entered, the cursor prompts the operator to enter a new password. Type a password and press ENTER. The password must be confirmed by answering **the** prompt:

Confirm (Y/N)

Press the Y key for yes or the N key for no.

Changing the password

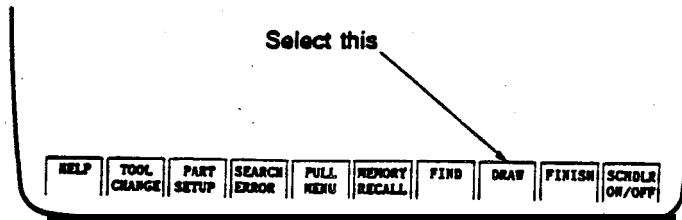
When a password has been registered, Selecting the password function prompts the operator to enter the old password. If an incorrect password is entered, the status line displays the message **Wrong** password - Press ESC'. When the correct password is **input**, the cursor prompts the operator to enter a new password. Type a password and press ENTER. The password must be confirmed by *answering* the prompt:

Confirm (Y/N)

Press the Y key for yes or the N key for no.

CALLING THE GRAPHICS PROCESSOR

Press the DRAW function key to call the graphics processor (See CHAPTER V).



EDITOR WORDPROCESSING FUNCTIONS

This section **describes** the use of the **editor's** typing and text processing features **including** cursor control functions, and text block operations. (Editor commands, 'Block functions, **Goto/find** functions.)

CTRL KEY USE AND NOTATION

All **wordprocessing commands** can be initiated by typing a control sequence. Most of the **commands** can also be performed using a single key on the keyboard or through menu **selection**. A few can be initiated only by typing the control sequence. A **control sequence requires simultaneously** pressing the CTRL key and a letter. In written **notation**, the caret symbol (^) designates that the **CTRL** key is required as the letter is typed. For **example**:

^F means **press CTRL** simultaneously with f

^Y means **press CTRL** simultaneously with y

Sometimes a second **letter** must be typed to completely specify a function. When a second letter is required, the notation appears as follows:

^K-B means **press CTRL** simultaneously with k and then type b

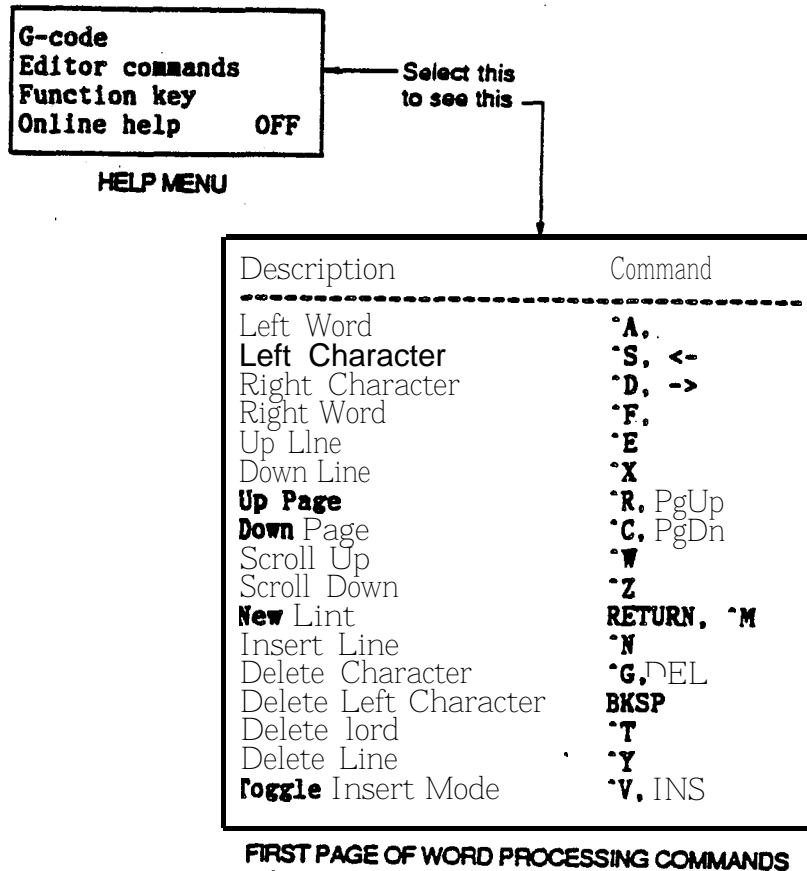
^K-K means **press CTRL** simultaneously with k and then type k

BASIC EDITING FUNCTIONS .

There are many editing functions. Editor command help will list all of the **wordprocessing** commands. The basic editing functions include the **editor** command help window, typing mode, delete functions, scrolling functions, cursor movement commands, text block functions and **goto/find** functions.

Online command summary

All wordprocessing functions not listed under one of the pull-down menus are summarized in the editor command window. To display the window, press the HEW function key and then select "Editor commands" in the help menu window. The editor command window appears as below:



Use the PgDn/PgUp keys to scroll to next/previous page of commands.

Enabling insert mode

Toggling the INS key alternates the typing mode between Overtyping Mode and Insert Mode. The status line displays the IN indicator when Insert Mode is active.

Inserting characters

When a character is typed in Overtyping Mode:

The only cell on the display to change is the one with the cursor. The new character replaces the old one. The cursor moves to the next cell.

When a character is typed in Insert Mode:

All cells from the cursor to column 79 shift right once. The new character is placed in the vacated cell and the cursor moves to the next cell. If a non-blank character exists in column 80, the shift does not occur and the typed character is discarded.

Inserting lines

The **ENTER** key is the carriage return/newline key.

When ENTER is pressed in Overtyping Mode:

The cursor moves to the beginning of the next line. The data remains unchanged.

When ENTER is pressed in Insert Mode:*

All lines below the cursor move down one line and any characters following the cursor to the end of the line are moved to the beginning of the next line. The cursor also moves to the beginning of the next line.

The effect of using ENTER in Insert Mode is to split a line into two lines with the cursor moving to the lower line. If the cursor is in column 1 when the split occurs, then the upper line is left blank. (To recover from inadvertently pressing ENTER in Insert Mode, return to the end of the truncated line and perform a character delete. This will delete the new carriage return and rejoin the original line.)

***If Online Check is enabled, the first depression of the ENTER key will not insert a new line if a syntax error is detected. Pressing ENTER a second time without changing the cursor position will split the line.**

Delete functions

To delete:	
The character at cursor	DEL key (^G)
The character to left of cursor	backspace key
All characters from cursor up to next word	^T
The whole line	^Y
All characters from cursor up to end of line	^Q-Y
A marked block of text	^K-Y

Scrolling functions

Scrolling shifts the portion of the program in view up or down a line or page.

To scroll view:	
Down one line	^Z
Down one page	PgDn key (^C)
Up one line	^W
Up one page	PgUp key (^R)

In line scrolling, the cursor shifts with the statements but not off the screen. In page scrolling, the cursor maintains its position within the display as the data behind it moves.

Cursor movement functions

The following commands perform moves relative to the **cursor's** current location. Holding down the specified key or key combination for a sustained period will cause the operation to be repeated **until** the keys are released.

(RELATIVE CURSOR MOVES):

To move cursor

Right one position	right arrow key (^D)
Right one word	(^F)
Right to end of line	END key (^Q-D)
Left one position	left arrow key (^S)
Left one word	(^A)
Left to beginning of line	HOME key (^Q-S)
Down one position	down arrow key (^X)
Up one position	up arrow key (^E)

The following commands move the cursor to a specific target location. (See also "Branch and Search Functions".)

(**"GOTO"** CURSOR MOVES):

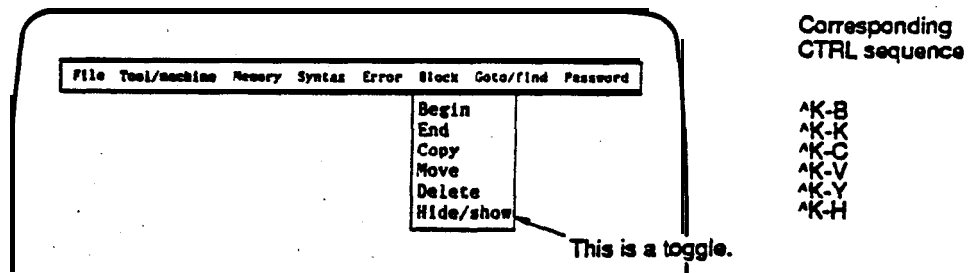
To move cursor	
Top of G-code program	(^Q-F)
Bottom of G-code program	(^Q-C)
line number xxx	(*Q-N) then type xxx ENTER
Column number xx .	(^Q-I) then type xx ENTER

TEXT BLOCK FUNCTIONS

A text block **is** defined by inserting block markers at the beginning and end of an area of the program to be manipulated. A block may include a single character or an unlimited number of characters spanning several lines. Once a text block is marked, block operations can be used to copy or move the text to another location within the program, or to delete the text.

Block functions menu

There are six text block commands. Each of the commands can be invoked by typing the **CTRL** sequence **^K** followed by a block command letter. For example, **^K-Y** is the command to delete the currently marked block of text. Another way to initiate a block command is by selecting Block from the pull-down window. When the Block **sub-menu** is displaying, standard menu selection techniques can be used to activate the desired command.



The operation of the commands are identical whether you use the menu or type the CTRL sequence.

Marking text blocks

The single rule for defining block markers is that the beginning marker location must precede the end marker location in the program.

To mark the beginning of the block:

Move the cursor to the first line of the block and then perform the Begin command.

To mark the end of the block:

Move the cursor to the last line of the block and **perform** the End command.

Each **time** you perform the Begin command, the previous beginning block marker **is** automatically deleted so that no matter how often you perform the command there is **never** more than one beginning marker in the program.

Similarly, you may adjust the **location** of the end marker by performing another End command. You may perform the End command before performing the Begin command. You may perform both commands in any sequence and as **often** as you wish until you have included the exact data you want.

You may **perform** a block operation, then change one of the markers and perform another block operation. The block markers are not deleted when a block operation is performed except when the block is deleted. You may edit the data within a marked block of text with no restrictions. Block markers are deleted by cancelling the highlighting (See "**Block** hide/show").

Block **operations** (copy, **move**, delete)

Copy: Inserts a copy of the marked block at the line below the cursor. The block marker definitions remain in the original block, such that the copied insert will not be marked or highlighted. If you edit the copied insert, the original block remains unchanged. You may copy the original block to more than one location in your program, making whatever revisions are necessary in each copy without effecting the original.

Move: Inserts the marked block at the line below the **cursor**. The block marker definitions are changed to correspond to the new location of the block and the data will remain highlighted. You may move the block again if you discover it is in the wrong place.

Delete: Deletes all data between the block markers and the block markers themselves.

Block hide/show

This toggle aitemately:

- Removes the highlight from the current block.
- Restores the highlight to the current **block**.

This function is primarily used to discontinue highlighting of a marked block that we have finished operating on. It effectively deletes (but remembers the location of) block markers in order to remove highlighting after copying or moving a block. The next time either the **Begin** or End command is performed, block highlighting mode will be restored so that the new block will be highlighted once both markers are defined.

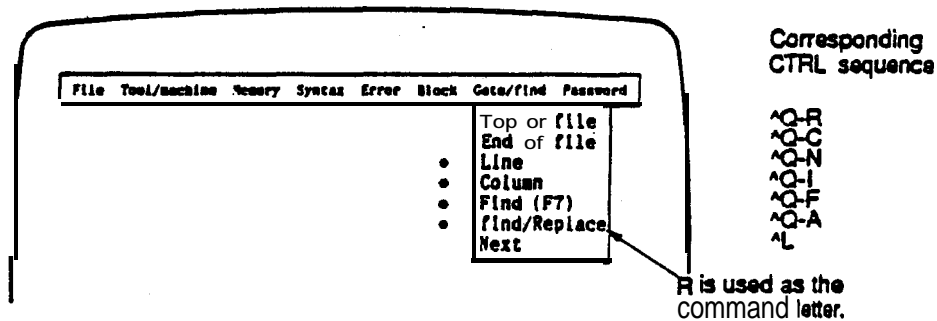
You may also use this function to m-highlight the previous block in order to perform another block operation with it or to adjust one or both of its marker positions and then perform a block operation.

BRANCH AND SEARCH FUNCTIONS

"GOTO" commands will position the cursor at a specific line number within the program or at the **first** or last line of the program. The cursor may also be jumped to a specific column within a line. The search commands can locate (Find) a specified string of characters within the program and position the cursor at this location. Optionally, new data can be defined to replace all or designated occurrences of a specified string.

Goto/find functions menu

There are four GOTO commands and three search commands. Each of the commands can be invoked by **typing** the CTRL sequence **^Q** followed by a command letter. For example, **^Q-R** is the command to GOTO the first line (top) of the program. Another way to initiate one of these commands is by selecting **Goto/find** from the pull-down window. When the **Goto/find** sub-menu is displayed, standard menu selection techniques can be used to activate the desired command.



* indicates the prompt appears after the command is initiated.

The operation of the commands are identical whether you use the menu or type the CTRL sequence.

Goto operations (top, end, line, column)

Top of file: Moves cursor to line 1 of program.

End of file: Moves cursor to last line of program.

Line: Moves cursor to specific line of program. At the prompt, type the line number and press ENTER.

Column: Moves cursor to specific column in line. At the prompt, type the column number and press ENTER. Legal values are 1 through 80.

Search options window

The operation of both the Find and the Replace commands can be tailored by specifying any combination of options in response to the 'Options: ' prompt that appears when the commands are activated. Whenever the prompt appears, the options window appears:

File	Tool/machine	Memory	Syntax	Error	Block	Code/find	Password	
02011 (AMADA -- NO.2000_11)						Top of file		
G92X72.750						End of file		
G72X3.405Y6.391						Line		
G6810.147J90.K90.P000.047T105						Column		
Find: G72								
Replace: G70								
Options:								
G6810.167J180.K180.P000.047								
X4.723Y8.431								
X4.998Y5.432								
X4.998Y4.392								
X4.724								
X4.271Y7.251								
X3.022Y4.679								
X4.181								
X3.602Y5.683								
X3.478Y7.348								
OPTIONS: G - Global Search B - Back Search U - Ignore Case W - Whole Word (REPLACE ONLY) N - No Confirmation 1..9 - # times to repeat ON - Whole File, No Confirmation								
HELP	TOOL CHANGE	PART SETUP	SEARCH ERROR	PULL REW	MEMORY RECALL	FIND	DRAW FINISH	SCHDLR ON/OFF

Two options (N and 1..9) apply only to the Replace command and are described with the Replace command. The common options are:

- G** Causes a forward search to begin at the top of the program. When used with B option a backward search begins at the end of the file. When **G** is not selected, searches begin at the current cursor position.
- B** Search backward. When B is not selected, the search proceeds forward.
- U** **ignore** upper/lower case setting. When U is not selected, search **will** require that cases match on all letters.
- W** Only match on **string** if a whole word. When W is not selected, a string will be located even when letters or digits are adjacent. For example, 'if' would be located within 'difference'.

Search operations (find, replace, next)

Find: Finds one or more occurrences of a **specified** string of characters. At the **first** prompt ('Find: '), type the **string** and press ENTER. Spaces **may be contained in** the **string**, however, the exact number of spaces must match. For the second prompt ('Options: '), the options reference window **will** appear. Type any **option** letters that apply and press ENTER. For example, to enable all Find options you could type UBWG. To search with the default options, press ENTER at **the options** prompt.

Next: Moves the cursor to the next occurrence of a string located by the previous Find or Replace command.

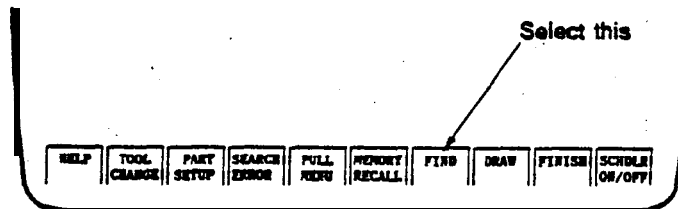
Replace: Replaces one or more occurrences of a specified string with new data, pausing **for confirmation** if that option is selected. At the **first** prompt ('Find: '), type the **string** to locate and press ENTER. At the second prompt ('Replace: '), type the new data and press ENTER. Spaces may be contained in both the existing **and new** string definitions. For the third prompt ('Options: '), the options **reference** window will appear. Type any option letters that apply and press ENTER. For example, to enable **all** Replace options you could type **UBGWN**.

The search options that apply only to the Replace command are:

N Do not wait for confirmation, make change automatically. When this option is not selected, each time the string is located, a 'Replace (Y/N):' prompt will appear. To replace the **string**, **answer Y**; otherwise, **press N**. Press the ESC key to end the search before all occurrences have been located.

1..9 Limits the number of matches to locate. For example, **you** could type **B4** to initiate a backward search repeated 4 times.

Find function key



The Find function key has the identical function as the Find command on the **Goto/Find** menu.

EDITOR FILE MANAGEMENT FUNCTIONS

This section explains the file save operations and options, and the program merge functions.

WHAT GETS SAVED

When a G-code program is saved, its data is written to two different files.

- (1) The part program is saved in the CNC.
- (2) The **PART** SETUP and TOOL SETUP data associated with the part program is saved in the MMC.

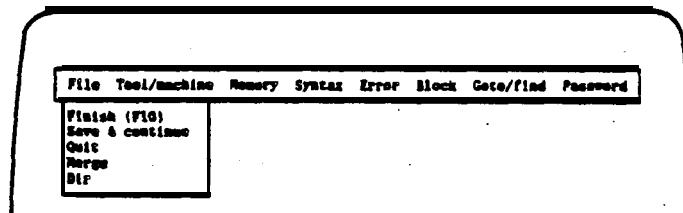
WHAT DOES NOT GET SAVED

When a G-code program is **saved**, the following information is not recorded, but may be regenerated during the next edit of the program:

- (1) The internal buffer marks showing lines with syntax **errors** or **simulator** warnings.
- (2) The cursor's current position (line and column) and block markers.

FILE FUNCTIONS MENU

Selecting "File" from the pull-down window displays the menu of File functions:



Pressing the ESC key to remove the menu.

File operations (finish, save & continue, quit, merge, dir)

Finish: Saves the updated **part** program, PART SETUP, and TOOL SETUP in the appropriate files (see "What gets saved" above). Before the save is executed, the part program is checked for syntax errors. If any errors are found, the program remains in view and **all** errors must be corrected before the part program can be saved. If no errors are found, the editing display is cleared and the Program Select page reappears.

Save & continue: Saves the program as in Finish, but will not save PART SETUP and TOOL SETUP. A whole program check is not performed before the program is written to the CNC. The Pile menu is cleared, but the program **statements** remain in view and the cursor position does not change. Editing may **continue**.

Quit: Nothing from the current edit is saved. The part program remains in the CNC as it was before the edit began. The editing display is cleared and Program Select page reappears.

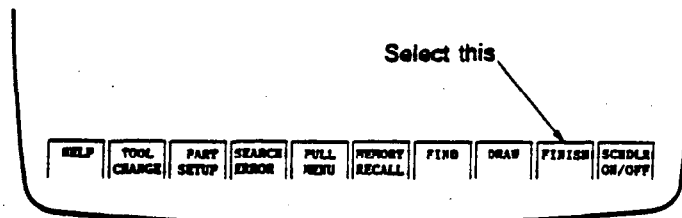
(IMPORTANT NOTE)

Study the Quit command. It is easy to make a mistake and lose hours of good work

Merge: Inserts the contents of the specified file into your program at the line below the cursor. When the function is selected, a program directory window appears. Select a program number using standard selection techniques. When the directory contains more than 22 files, press the PgUp or PgDn key to view the previous/next page. Press the ESC key to remove the display.

Dir: Displays the program directory. DIR display is almost the same as the merge display except there is no prompt to select a program.

Finish function key



Pressing the FINISH function key is identical to selecting Finish from the File menu.

CALLING OTHER FUNCTION FROM MAIN MENU

When another function is selected from the main menu while **editing** a part program, the following prompt appears to confirm whether the edited program should be saved:

Save file? (Y/N)

Typing Y executes the Save function and if there are no errors, the selected function is called. Typing N executes the Quit function and the selected function is called.