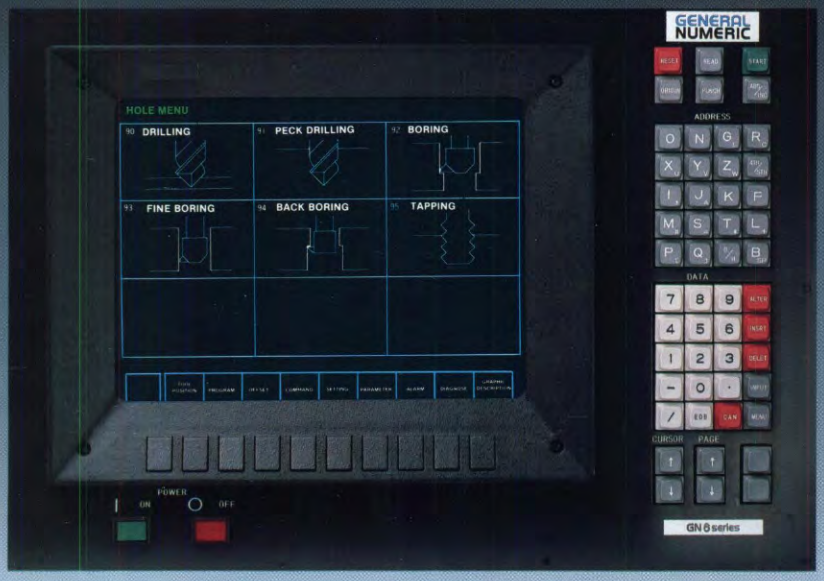
GENERAL NUMERIC

COLOR GRAPHIC DISPLAY CONFIRMATION WITH CONVERSATIONAL AUTOMATIC PROGRAMMING

The GN6MB, is already a leading member in the General Numeric lineup of CNC systems, it now has been significantly enhanced to offer higher performance and easier operation. Among the many new features incorporated in the GN6MB are conversational automatic programming (patent pending), graphic display, color or monochrome, and 5-axis (4-axis simultaneous) control. The new GN6MB is ideally suited to meet a wide range of user needs.

- Drilling programs can be prepared directly at the machine tool through conversation with the graphic display. The same convenience is possible for milling operations, such as contouring and pocket machining.
- Color or monochrome displays are available.
- The graphic display screen can be easily used to confirm tool paths as well as bi-planar workpiece drawings.
- Isometric Displays are also possible.



MILLING CONTROL GN6MB-2

CONTENTS

FREE-STANDING TYPE

59(H)x23.6(W)x27.6(D) inch. Allows you to configure an NC-independent CNC machine tool in which the main control unit, tape reader with reels, velocity control units, and MDI/DPL unit are all incorporated in the cabinet. Machine tool and CNC can now be handled separately.

BUILT-IN TYPE 2

59(H)x27.6(W)x17.7(D) inch. Allows you to configure a CNC machine tool with integrated electrical and mechanical systems, in which the main control unit, tape reader with reels, and MDI/DPL unit are incorporated in the cabinet, while the velocity control units are connected separately on the machine.

PENDANT TYPE

23.6(H)x23.6(W)x13.8(D) inch. Allows you to configure a CNC machine tool in which the main control unit is incorporated in a pendant operator panel, eliminating the need for additional space for the control unit on the machine. Tape reader and velocity control units are connected separately on the machine.

BUILT-IN TYPE 1

47.2(H)x30.3(W)x10.2(D) inch. Allows you to configure a CNC machine tool with integrated electrical and mechanical systems, in which the main control unit, tape reader without reels, and MDI/DPL unit are incorporated in the cabinet, while the velocity control units are connected separately on the machine.

UNBUNDLED TYPE

29.5(H)x22.0(W)x13.0(D) inch. Allows you to configure a small CNC machine tool with integrated electrical and mechanical systems in which only the main control unit is incorporated in the cabinet. The velocity control units, tape reader, MDI/DPL unit, and other units are all connected separately on the machine.

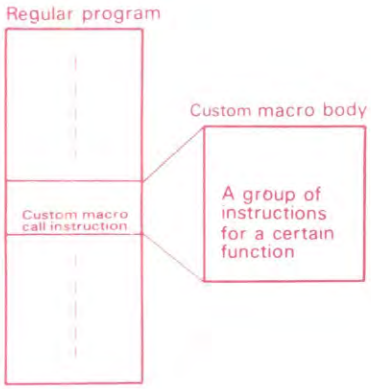
TURNKEY SYSTEM

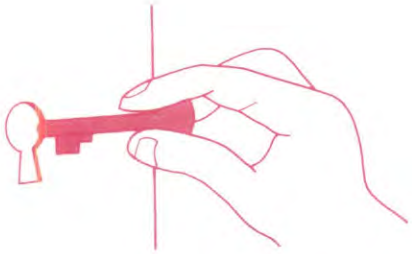
Permits you to configure a CNC machine tool by simply connecting the turnkey system with the appropriate machine tool. The main control unit, velocity control units, power box, machine operator's panel, MDI/DPL unit, and other units are all included in the turnkey system.

CUSTOM MACRO (option)

With the custom macro (body) the user can program, store, recall and execute his own automatic cycles, family programs, etc. In other words, the user or machine tool builder creates his own software, thereby creating unique software to match the needs of the NC machine tool, for enhanced functional expandability and individually tailored work capability.

- variables can be used.
- inter-variable calculations (add/subt/mult/div, trigonometry, binary/decimal transformations, etc.) are possible.
- branching is possible.
- remote reading and output of actual variable values are possible. (patent pending)





The registered custom macro can be locked in to prevent copying.

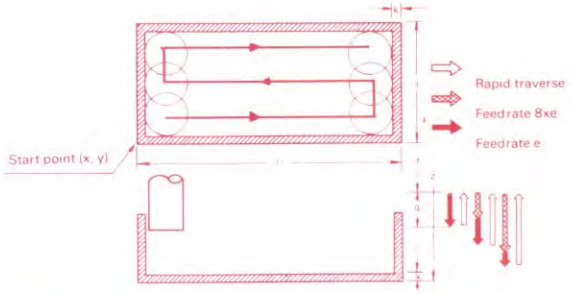
Pocket machining can be easily performed by using the custom macro. Once the custom macro is stored, only the parameter input is required to perform pocket machining.

Example

- Example of pocket machining
  Custom macro call instruction

G65 P9802 X x Y y Z z R r Q q I i J j K k T t D d F f E e;

x, y: X and Y axes absolute position of the starting point (lower left)
z, r: Z and R points absolute position (R point must be above Z point in the positive direction along Z axis)
q: Each cutting depth. (Must be given with a positive value)
i, j: Length of the pocket along X and Y axes. (Must be given with positive values. When i ≥ j, the machining becomes more efficient.)
k: Finishing allowance
t: Machining is done with a constant cutting width less than max. cutting width (Cutter diameter × t%)
d: Cutter compensation number (01 – 99)
f: Feedrate on the XY plane
e: Feedrate for cutting. The feedrate up to 1mm above the cutting surface is 8 × e.



PART PROGRAM STORAGE AND EDITING (patent pending)

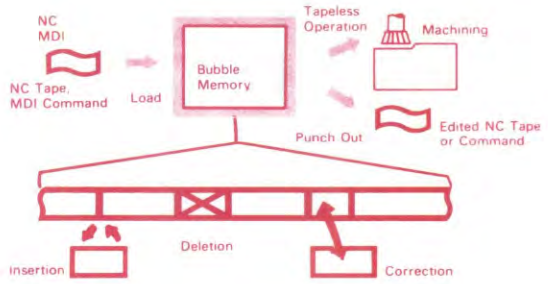
State-of-the-art bubble memories are used for part program storage. They provide a tape storage equivalency of 4224 ft. and no batteries are required.

- stores part programs and subprograms in memory.
  Capacity: 66 ft. (20m) of tape information as standard and 132/264/1056/2112/4224 ft. (40/80/320/640/1280m) as options.
- allows tapeless operation by storing the part program or custom macro in the memory and calling the stored subprogram as required.
- searches, deletes and corrects stored words, and blocks and inserts new words.
- searches and deletes part programs stored in the memory.
- operates the machine by the corrected part program.
- Connecting General Numeric PPR with the RS232C interface, programs can be input and output. (option)

This simplifies program debugging and correction.

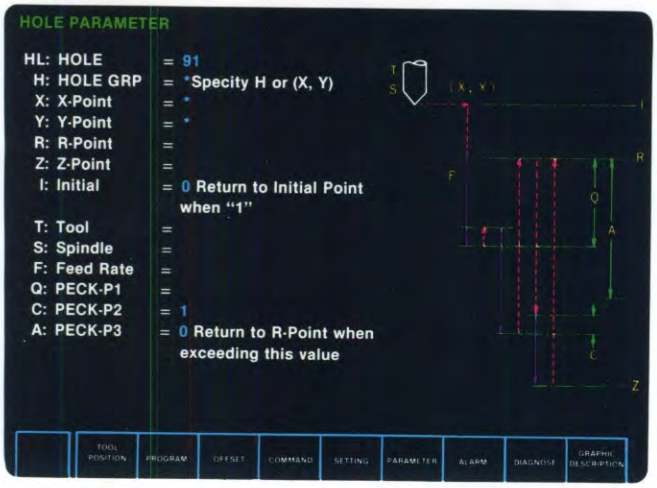
The problem of setting or changing NC tapes is eliminated.

The part program, which is stored in the memory, can be quickly modified to machine under the best possible cutting conditions. In addition, a large program memory is available which can store machining programs for days or months, just like DNC. Because bubble memory is employed, memory is retained without battery back-up.

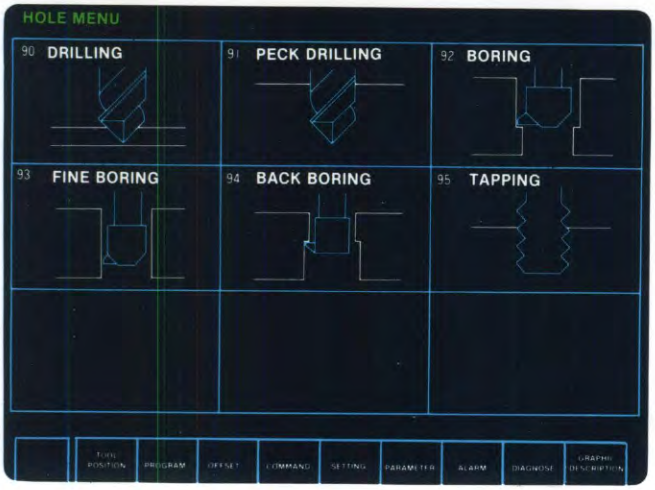


CONVERSATIONAL AUTOMATIC PROGRAMMING (PATENT PENDING)

Drilling programs can be prepared directly at the machine tool through conversation with the graphic display. The same convenience is possible for milling operations, such as contouring and pocket machining.

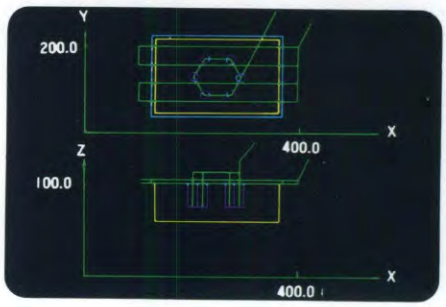


1. A conversational feature allows automatic programming and execution of the machining operations. When inquiries appear on the CRT screen, the operator responds in short key-in commands.

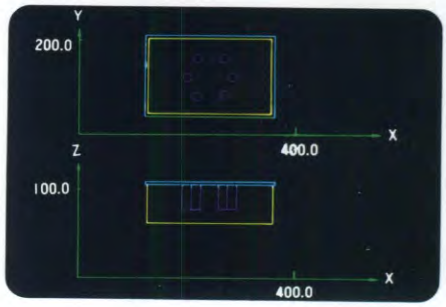


2. In addition to displaying the tool path, the CRT can also be used to graphically illustrate command data for conversational operations. Graphics of this type can also be easily programmed using custom macro.
3. Two types of CRT's are offered. Both provide high resolution and high legibility display.
   - 9" monochrome CRT: Present operator panel can be used.
   - 14" color CRT: Requires preparation of a larger operator panel.
4. Specific tool movements for drilling and milling operations can be easily programmed using custom macro. General Numeric supplies software for standard drilling and milling operations; based on this software, the user can then create his own software when required.
5. It is possible to combine the knowledge of the machine manufacturer with that of the end user to meet special customer requirements, e.g., for new drilling and milling patterns.
6. Specially created software can now be locked in to prevent access by unauthorized personnel.
7. The software is stored in a bubble memory, which eliminates the need to prepare a maintenance memory (EPROM).

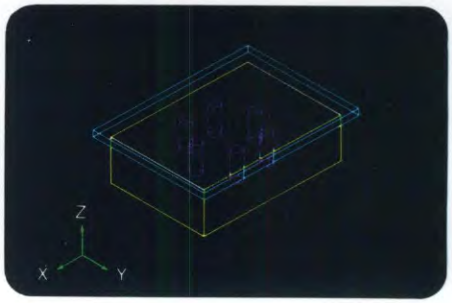
GRAPHIC DISPLAY CONFIRMATION



8. The programmed tool path is graphically displayed on the CRT. With the color CRT, a different color is used for each tool, for easier reading.



The graphic display screen can be easily used to confirm tool paths as well as bi-planar workpiece drawings.



Isometric displays are also possible.

9. Family-type workpiece shapes are especially easy to execute, as they require only a minimum of input data.
10. Using custom macro it is also possible to program algorithms for automatically setting machining conditions (feedrate, spindle rotation speed, etc.).
11. Custom macro can also be used for programming complex machining operations (e.g., for tapping operations–first carrying out the center drilling, then drilling, then tapping). At this time, tool changes via ATC are not performed for each drilling operation but rather for each full process.
12. Programming operations can be executed during machining, for a higher machine cost-efficiency ratio.
13. Machining centers and NC milling machines (equipped with the GN6MB can perform conversational functions in addition to existing functions.
14. Previously prepared NC tapes can now be utilized without alteration. It is also possible to edit previously prepared NC tape programs and new conversational programs into one single new program.

5-AXIS CONTROL (option)

As an extension of the previously available 4-axis control, the new GN6MB features control of up to 5 axes (4 simultaneously). Any U, V, W, A, B, or C can be used as the fifth axis address. The fifth axis can serve as both a linear axis and a rotary axis.

4-AXIS SIMULTANEOUS CONTROL (option)

The GN6MB is capable of 4-axis simultaneous control, including the additional fourth or fifth axes.

80 ft./min. MAX. RAPID TRAVERSE RATE

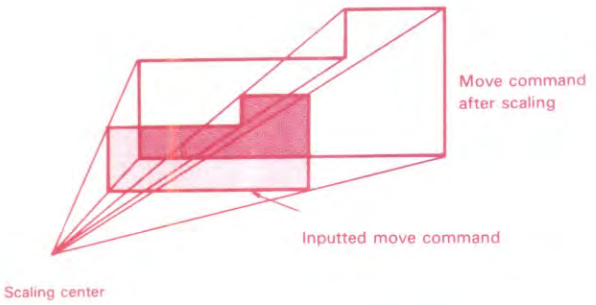
The rapid traverse rate can be increased up to 80 ft./min., for reduced machining time.

0.5μ, 0.00005 INCH INTERPOLATION UNIT

The interpolation unit can be set at 0.0005mm or 0.00005 inch. This permits even greater machining accuracy than previously possible.

SCALING (option)

Program command values can be scaled anywhere in a range from 0.001 to 99.999 times.

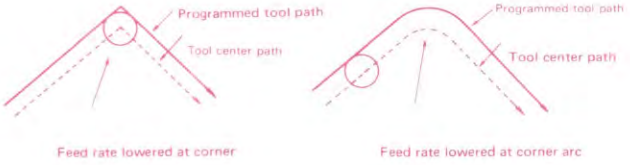


HANDLE INTERRUPTION (option)

During automatic operation, it is now possible to adjust the position of the tool by means of the manual pulse generator, without the need for mode changing. Pulses from the manual pulse generator are added to the automatic operation commands without interrupting machining.

AUTOMATIC CORNER OVERRIDE (option)

With this feature, the feedrate is automatically lowered when cutting inner corners in the cutter compensation mode. This prevents overloading of the cutter at the corner, for smoother cutting surfaces.



CONSTANT SURFACE SPEED CONTROL (option)

With this function, the spindle speed is varied in accordance with the changes in the tool position so that the surface speed (the relative speed of the tool cutter to the workpiece) always maintains the value commanded by the program S code. It is used with turning centers and face plate in which the cutter can be moved in the radial direction.

MANUAL ARBITRARY ANGLE FEED (option)

For easier manual operation, it is possible to use the manual feed to shift the cutter in the desired direction on the XY plane.

MENU SWITCH (option)

With this feature, it is possible to carry out certain operations which earlier were controlled by switches on the machine operator's panel now by setting via MDI and CRT. This permits simplification of the operator's panel.

Functions which are controllable by the menu switch:

Single block, Machine lock,
Display lock, Auxiliary function lock,
Dry run, Optional block skip,
Mirror image, Z-axis neglect,
Absolute switching

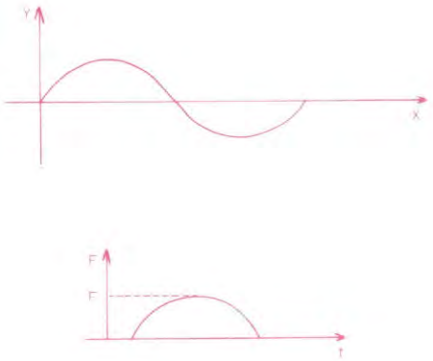
SEQUENCE NUMBER COMPARISON STOP (option)

During programmed operation, when the block with a preset sequence number appears, operation ceases following execution of that block.

SINE CURVE INTERPOLATION (option)

Sine curve interpolation can be carried out for any plane (X-Y, Y-Z, X-Z).

It is also possible, during single-axis commands only, to change the feed rate to a sine curve.



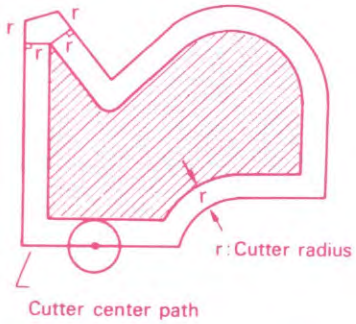
TOOL LIFE MANAGEMENT (option)

With this function, it is possible to designate a spare tool in advance and carry out automatic tool changing. The NC counts the tool utilization time or number of tool utilizations, and when the preset tool life is reached, the tool is automatically exchanged for a new one. Cutter compensation data can be automatically changed at this time.

CUTTER COMPENSATION (G40 ~ 42, option)

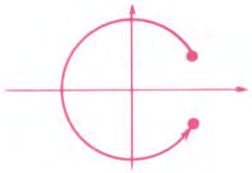
Cutter compensation using the crosspoint calculation method is available for all lines and circles. Since cutter compensation is possible even for inner corners, calculation during programming is simplified.

Up to 200 pcs. of cutter compensation data can be accommodated.



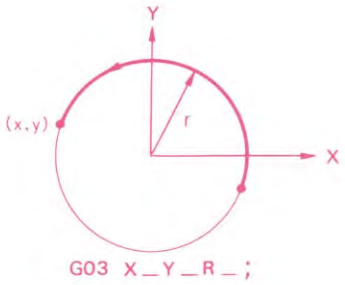
MULTI-QUADRANT CIRCULAR INTERPOLATION (option)

In any plane (XY, ZX, and YZ planes), circular interpolation in multi-quadrants can be performed by a command from one block.



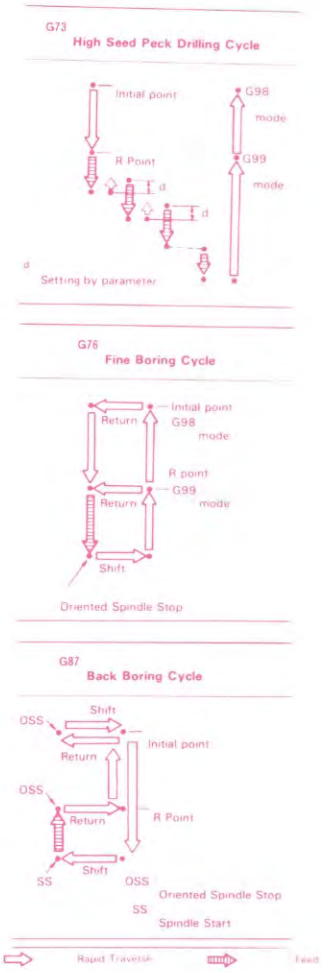
CIRCULAR INTERPOLATION BY RADIUS DESIGNATION (option)

Circular interpolation is directly specified by the end point of an arc and the radius. No auxiliary calculations for the center coordinates are necessary. (The conventional method using parameters, I, J and K is also possible.)



CANNED CYCLE (option)

Available are 12 different types of canned cycles for drilling, tapping and boring. Unique to the GN6MB are High Speed Peck Drilling Cycle, Fine Boring Cycle (including spindle orientation), and Back Boring Cycle.



INCH/METRIC CONVERSION (option)

Any one of the following is possible.

1. Inch dimension input to a machine tool with inch ball screw.
2. Inch dimension input to a machine tool with metric ball screw.
3. Metric dimension input to a machine tool with inch ball screw.
4. Metric dimension input to a machine tool with metric ball screw.

Inch/metric conversion is designated by G code, operation caused by an operator's mistake can now be eliminated.

AUTOMATIC RECOGNITION OF EIA OR ISO (ASCII) (option)

After reading the first EOB code, either EIA or ISO code is automatically selected.

COMBINED USE OF ABSOLUTE/ INCREMENTAL PROGRAMMING WITHIN THE SAME BLOCK

G90 for absolute dimensions and G91 for incremental dimensions can be programmed within a block.

DIRECT PROGRAMMING IN INCH/MIN. OR MM/MIN.

Feed rate is programmed directly in inch/min. or mm/min. Override can be effected in the range of 0 to 200% in 10% increment.

CRT CHARACTER DISPLAY AND KEYBOARD-TYPE MANUAL DATA INPUT (MDI) (patent pending)

The 9" CRT character display can simultaneously display various types of data, complete with explanatory messages, greatly enhancing operability and facilitating operating status confirmation. The following types of data setting and display are possible:

- input and display of NC command data.
- setting and display of tool offset values for each axis, with concurrent display of the current position.
- display of various alarm signals.
- display of self-diagnostic results.
- setting and display of various functions and parameters such as minimum increment values, rapid traverse speeds, acceletion/deceleration time constants for rapid traverse for X, Y and Z axes and backlash compensation values.
- display of current position (triple size numbers are displayed) and sequence number.
- display of programs stored in the memory during the cycle operation.
- display of remaining movement during cycle operation.
- display of programmed feed rates, spindle speed and actual feed rates including override.
- display of various data related to spindle speed and tool functions during cycle operation.
- in addition to the operating block, block programs are displayed for several earlier and subsequent blocks during memory operation.
- remote signals can be used for displaying arbitrary (prepared by machine tool builder) alarm messages or message to the operator. (option)

PROGRAM RESTART (option)

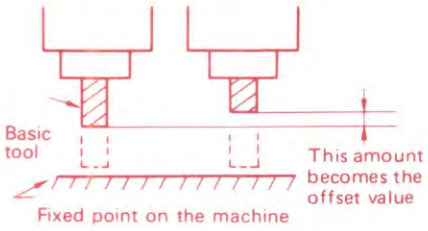
With this function, it is possible to restart machining by setting the desired sequence number of the program being used. The NC stores in memory the modal status from the program start to the given sequence number. To attain a desired M, S, T-Code, first output the code on the MDI, then push the start button: the tool will automatically move to the start position and machining will restart.

EXTERNAL WORK NUMBER SEARCH (option)

With this function, remote instructions (e.g., from the machine) can indicate selection from the NC memory the machining program required, and thereby execute that program.

TOOL LENGTH MEASUREMENT (option)

By aligning each tool against a fixed point on the machine and pushing the input button, tool length compensation values for each tool can be set.



AUTOMATIC RETURN TO REFERENCE POINT AND CHECK

A machine slide can be moved to its reference point by a tape command.

When the machine slide reaches the reference point, it stops automatically and the indicator lights up. It is also possible to set the 2nd, 3rd and 4th reference point. (option)

RAPID TRAVERSE OVERRIDE (option)

100%, 50%, 25% and a predetermined slow speed is selected as a rapid traverse override. Tape verification is now easier.

INCREMENTAL FEED

Movement amount per step by manual feed, 0.0001, 0.001, 0.01, 0.1, 1 and 10 inches (0.001, 0.01, 0.1, 1, 10 and 100mm) are available.

F1 DIGIT FEED (option)

Setting F1–F9 are possible (Fo: rapid traverse). Feed speed changes are possible via a manual pulse generator.

ADDITIONAL OPTIONAL BLOCK SKIP (option)

By the addition of a number (1 ~ 9) after the slash code (/), it is possible to increase the variety of optional block skips to 9.

RUN HOUR DISPLAY (option)

The automatic operation time of the machine can be integrated and displayed to the second. Reset is also possible. The result is easier progress management of work, tool management and maintenance.

GENERAL NUMERIC CASSETTE (option)

A compact and easy-to-use "GENERAL NUMERIC cassette" (patent pending) can be used for convenient transfer and storage of NC command data.

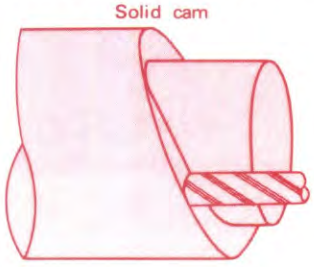
Bubble cassette 264/528 ft. tape equivalency
LSI cassette 66 ft. tape equivalency

GENERAL NUMERIC PPR (option)

The GENERAL NUMERIC PPR can serve as an input/output device for NC command data. It performs paper tape punching and reading as well as NC data printout.

HELICAL INTERPOLATION (option)

By 3-axis control of a circular interpolation in the X-Y plane and a linear interpolation in the Z axis, thread cutting of large diameters and solid cams can be easily machined.



ELECTRIC SPINDLE ORIENTATION CONTROL (option) (patent pending)

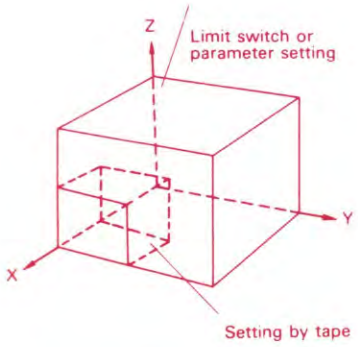
The spindle orientation control is performed electrically without mechanical structure, reliability is increased and orientation time substantially reduced.

This option is available only when a GENERAL NUMERIC spindle motor is used.

STORED STROKE LIMIT (option) (patent pending)

A forbidden area can be established by parameters or program. Inside or outside of the forbidden area is selected by parameters.

It can prevent the tool from colliding with the workpiece or the jig because of a programming mistake or an erroneous operation.



STORED PITCH ERROR COMPENSATION (option)

This unique GENERAL NUMERIC feature increases machining accuracy and extends the useful life of the machine tool by allowing digital compensation for mechanical wear of the ball screw. Costly installation and adjustment of the mechanical dogs becomes unnecessary.

THREAD CUTTING AND SYNCHRONOUS FEED (option)

By using a position encoder on the spindle, thread cutting and synchronous feed operations can be carried out.

AUTOMATIC ACCELERATION/ DECELERATION FOR FEED (option)

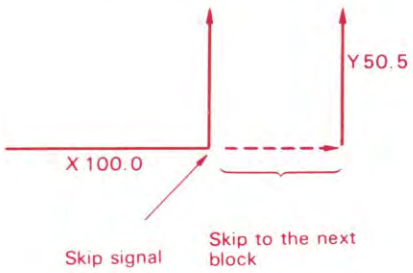
Exponential type acceleration/deceleration can be carried out during cutting feed and JOG feed.

Use in combination with large-scale servo motors.

SKIP FUNCTION (option)

Upon remote signaling, the remaining area of linear interpolation can be skipped and processing will proceed immediately on to the succeeding block.

Use for measurement of length, etc.



GENERAL NUMERIC PC (PROGRAMMABLE CONTROLLER) (option)

Thanks to unique functional instructions, the NC-incorporable, GENERAL NUMERIC PC can carry out complicated power sequence control functions with ease.

• MODEL A:	2,000-step	DI: 192 pt.	DO: 128 pt.
• MODEL B:	5,000-step	DI: 192 pt.	DO: 128 pt.

RESOLVER AND INDUCTOSYN INTERFACE (option)

For position feedback devices, pulse encoder, optical linear scale, resolver and inductosyn can be used.

HIGH PERFORMANCE, EXTREMELY HIGH RELIABILITY

Overall reliability has been increased and the performance/cost ratio substantially improved with many excellent and pioneering techniques, such as the use of the "Bubble Memory", the latest memory device in addition to high-speed microprocessor, custom LSI's, etc. In addition, cabinets are totally enclosed using a unique heat exchanger, increasing reliability.

If a drift in the servo loop occurs, it is automatically compensated to maintain accurate positioning.

Careful selection of components and extensive performance testing before shipment ensure long-lasting, trouble-free operation.

EASIER MAINTENANCE

Maintenance of the GN6MB is extremely easy.

- Thanks to its self-diagnostic capability, internal operating conditions can be continuously monitored, and checked. In the event of a malfunction, operation ceases immediately and the source of the malfunction is detected and displayed.
- All On/Off signals going out of and into the logics can be shown on the display, even during cycle operation.
- All signals going out of and into the NC can be checked at the connectors.
- Any On/Off signal going out of the NC can be issued manually through the manual data input in a bit-by-bit manner.
- Various preset parameters such as acceleration/deceleration time constants and rapid traverse speed can be shown on the display.
- Causes for alarm are classified in detail (about 160 types) and are shown on the display.
- NC operating status is continuously displayed based on 9 types of classification.
- Signals from the pulse encoder and position encoder appear on the display.

SPECIFICATIONS (__Functions are upgraded.)

STANDARD

Automatic Acceleration/Deceleration: Linear for rapid traverse, exponential for feed
Auxiliary Function Lock
Backlash Compensation: Max. 255 pulses
Buffer Storage
Canned Cycles A: Drilling, Tapping and Boring (G80, 81, 82, 84, 85, 86, 89)
Combined Use of Absolute/Incremental Programming in the same block of tape
Constant Tangential Feed Rate Control
Controlled Axes: 3 axes (X, Y and Z)
Decimal Point Programming
Dwell
Exact Stop
External Mirror Image
Feedback: Pulse Encoder

Feed Rate Designation: Direct programming in inches/min. or mm/min. (Manual override 0 ~ 200%)
Feed Rate Range: Refer to Table 1
Increment System: Refer to Table 1
Interlock
Interpolation Unit 0.0005 inches or 0.0005mm
ISO Code Input: ISO 840 (Automatic recognition of EIA/ISO)
Keyboard-type Manual Data Input (MDI) and CRT Character Display
Least Input Increment: 1/10
Manual Absolute ON/OFF
Maximum Programmable Dimensions: ±8 digits, refer to Table 1
Miscellaneous Function: M2
Multi-quadrant Circular Interpolation
Optional Block Skip
Overtravel
Part Program Storage and Editing: Capacity; Any one of 66*/132/262/1050/2100/4200 ft. (20*/40/80/320/640/1280m) of tape information
*Max. 49 ft. (15m) when stored pitch error compensation is selected.
Positioning, Linear Interpolation
Power Supply: AC 200/220/230/240/380/415/440/460/480/550V +10%, −15% 3-phase, 50/60 Hz ±1Hz
Programming of Absolute Zero Point
Program Number Search
Rapid Traverse: Refer to Table 1
Rapid Traverse Override: Fo, 25%, 50%, 100%
Reference Point Return A: Manual, Automatic (G27, 28, 29)
Remote Power ON/OFF
Self Diagnosis
Sequence Number Display: 4 digits, Independent display other than data
Sequence Number Search
Simultaneous 3 Axes Control
Spindle Function: S2
Tape Code: EIA RS-244-A
Tape Format: Refer to Table 2
Tape Reader:
Without reels: 300 ch/sec (60Hz) 250 ch/sec (50Hz) Photoelectric (Light emitting diodes) Tumble box capacity: Free-standing type cabinet or built-in type 2 cabinet; 99 ft. (30m) Built-in type 1 cabinet; 33 ft. (10m)
Tool Function: T2
Tool Length Compensation: ±6 digits, max. 32 sets in memory (G43, 44, 49)
Z-axis Command Cancel

OPTIONS

Addition of Registerable Programs: Total 191 (This option is possible only when part program is 262/1050/2100/4200 ft.)
Additional Axis Simultaneous Control: (For simultaneous 2 or 3 axes control)
Additional Offset Memory: Up to 64 sets in total
Additional Offset Memory: Up to 99 sets in total (This option is possible only when part program storage capacity is 132/262/1050/2100/4200 ft.)
Additional Offset Memory C: Up to 200 sets in total
Additional Optional Block Skip
Automatic Acceleration/Deceleration for feed
Automatic Corner Override
2nd Auxiliary Function: B3
Bubble Cassette and Adaptor
Canned Cycles B: Drilling, Tapping and Boring (G73, 74, 76, 80, 89)
Circular Interpolation by Radius Designation
14" Color CRT
Constant Surface Speed Control
Conversational Automatic Programming Function (Usable with part program storage capacity 264 ft. or more)
Custom Macro (Memory capacity for variables: 2.5 ft. (1m) of tape information)
Cutter Compensation B: ±6 digits, max. 32 sets in memory (G40 ~ 42)
Cutter Compensation C: ±6 digits, max. 32 sets in memory (G40 ~ 42)
Electric Spindle Orientation Control
External Data Input: Alarm message and operator message can be displayed
External Deceleration
External Work Number Search
F1 Digit Feed
Feedback: Resolver/Inductosyn
Five Axes Control
Four Axes Control
Feedrate Sign Curve Control
GENERAL NUMERIC 3000C Format
GENERAL NUMERIC PPR
Graphic Display
Handle Interruption
Helical Interpolation
Inch/Metric Conversion: Switchable by G codes
I/O Interface: RS232C, FACIT4070 or ASR43/33
LSI Cassette and Adaptor
Manual Arbitrary Angle Feed
Manual Pulse Generator: Multiplication (×1, ×10, ×100) is possible.
Menu Switch
Portable Tape Reader
Program Restart
Programmable Controller: GENERAL NUMERIC PC-MODEL A (2000 steps, DI: 96 points, DO: 64 points) GENERAL NUMERIC PC-MODEL B (5000 steps, DI: 96 points, DO: 64 points)
Reference Point Return B: Manual, Automatic (G27, 28, 29, 30) Return to the 2nd reference point is also available.
3rd and 4th Reference Point Return
Remote Type Position Display
Robot Interface
Run Hour Display
Scaling
Sequence No. Comparison Stop
Servo Motors: GENERAL NUMERIC Servo Motor series
Servo Units: PWM transistor drive, etc.
Simultaneous 4 Axes Control
Sine Curve Interpolation
Skip Function
Spindle Function S4

Spindle Motors: GENERAL NUMERIC AC or DC Spindle Motor series
Spindle Servo Units: PWM transistor drive
Stored Pitch Error Compensation
Stored Stroke Limit
Tape Reader:
With reels: This tape reader can be mounted in the free-standing type cabinet and the built-in type 2 cabinet.
300 ch/sec (60Hz)
250 ch/sec (50Hz)
Photoelectric (Light emitting diodes)
Reel capacity: 495 ft. (150m)
Threading and Synchronous Feed
Tool Function: T4
Tool Length Measurement
Tool Life Management
Tool Offset: ±6 digits, max. 32 set in memory (G45 ~ 48)

Table 1. Range of command value

	Metric thread for feed screw		Inch thread for feed screw	
	Metric input	Inch input	Inch input	Metric input
Least input increment	0.001 mm/0.01 mm* 0.001 deg	0.0001 inch 0.001 deg	0.0001 inch 0.001 deg	0.001 mm 0.001 deg
Least command increment	0.001 mm/p 0.001 deg/p	0.001 mm/p 0.001 deg/p	0.0001 inch/p 0.001 deg/p	0.0001 inch/p 0.001 deg/p
Max. programmable dimension	±99999.999 mm ±99999.999 deg.	±3937.0078 inches ±99999.999 deg.	±9999.9999 inches ±99999.999 deg.	±99999.999 mm ±99999.999 deg.
Max. rapid traverse	24000 mm/min	24000 mm/min	960 inch/min	960 inch/min
Feedrate range	1 ~ 15000 mm/min	1 ~ 15000 mm/min	0.01 ~ 600.00 ipm	0.01 ~ 600.00 ipm
Incremental feed	0.001/0.01/0.1/1.0/ 10/100 mm/step	0.0001/0.001/0.01/0.1/ 1/10 inch/step	0.0001/0.001/0.01/0.1/ 1/10 inch/step	0.001/0.01/0.1/1.0/ 10/100 mm/step
Rapid traverse override	Fo*, 25%, 50%, 100%	Fo*, 25%, 50%, 100%	Fo*, 25%, 50%, 100%	Fo*, 25%, 50%, 100%
Tool offset/Cutter compensation	0 ~ ±999.999 mm	0 ~ ±99.9999 inches	0 ~ ±99.9999 inches	0 ~ ±999.999 mm
Backlash compensation	0 ~ 0.255 mm	0 ~ 0.255 mm	0 ~ 0.0255 inch	0 ~ 0.0255 inch
Dwell time	0 ~ 99999.999 sec	0 ~ 99999.999 sec	0 ~ 99999.999 sec	0 ~ 99999.999 sec

* Setting by parameter

Table 2. Detailed format classification (including options)

Metric system	O04.N04.G03.XL+053.YL+053.ZL+053.αL+053.βL+053.ID053.JD053.KD053.F050.D03/H03.S02/S05.T02/T04. B03.QD053.RL+053.L04.P053.M02*
Inch system	O04.N04.G03.XL+044.YL+044.ZL+044.αL+044.βL+044.ID044.JD044.KD044.F032.D03/H03.S02/S05.T02/T04. B03.QD044.RL+044.L04.P053.M02*

(Note) α: Additional 4-th axis (A,B,C,U,V or W)
β: Additional 5-th axis (A,B,C,U,V or W)

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