



Service Procedures
Mazatrol Fusion 640
Publication # C640RA1010E



CAUTION

This Manual is published to assist experienced personnel on the operation, maintenance and/or programming of Mazak machine tools.

All Mazak machine tools are engineered with a number of safety devices to protect personnel and equipment from injury or damage. Operators should not, however, rely solely upon these safety devices, but should operate the machine only after fully understanding what special precautions to take by reading the following documentation thoroughly.

Do not attempt to operate or perform maintenance / repair on the machine without a thorough understanding of the actions about to be taken. If any question exists, contact the nearest Mazak service center for assistance.

Certain covers, doors or safety guards may be open or removed to more clearly show machine components. These items must be in place before operating the machine. Failure to comply with this instruction may result in serious personal injury or damage to the machine tool.

This manual was considered complete and accurate at the time of publication, however, due to our desire to constantly improve the quality and specification of all Mazak products, it is subject to change or modification.



Notes:

Mazatrol Fusion 640 Service Procedures	640
SAFETY PRECAUTIONS	S-1
LOCKOUT PROCEDURE	S-4
INSTALLATION PRECAUTIONS	S-5
WARNINGS	S-8
DOOR INTERLOCK SAFETY SPECIFICATION	S-11
Switch Panel Diagram	S-12
M640_Com.	1
M640 Data Xfer 3Digit For M640T,.....	1
M640 Data Xfer 3Digit For M640M,.....	1
M640_COM_HYPERTERMINAL.	1
M640_PrintKey_Instructions.	1
M640 Printer Information.	1
M640 Printer Setup Print To File	1
M640_Macro_Print.....	1
M640 Ethernet Network Logon Bypass.	1
M640 Ethernet Card Instruction	?
M640 SW Regional ExplanationB3a and C0.....	1
M640 Service Drive Directory.	1
FORMS	35
640M Version Form	35
640MT Version Form	18
640T Version Form	18
640 NC Software Claim Report	640
M640 Software -B Version Main Update Procedure.	1
M640 Re-Initialization Procedure.	1

M640 Data Save Procedure.	1
M640 Parameter Servo Spindle O PitchError.....	1
M640 Servo Update Procedure.	1
M640 Maintenance Display.	1
M640 PLC Display Explanation.	1
M640 PLC Corruption Recovery.....	1
M640 PLC Saving Floppy.....	1
M640 PLC Update Floppy.	1
M640 PLC LPC File Explanation.	1
M640 Floppy Installation Instruction.	1
M640 Hard Disk Replacement Procedure.....	1
M640 HR841 Installation.	1
M640 Option Installation Procedure.	1
M640 SanDisk Explanation.....	1
M640 Option Overload Detect	1
M640 Data Save SRAM Procedure.....	1
M640 Data Save BUSCON.....	1
INDEX	1

SAFETY PRECAUTIONS

The machine is provided with a number of safety devices to protect personnel and equipment from injury and damage. Operators should not, however, rely solely upon these safety devices, but should operate the machine only after fully understanding what special precautions to take by reading the following documentation thoroughly.

• BASIC OPERATING PRACTICES

DANGER:

- 1) Some control panels, transformers, motors, junction boxes and other parts have high voltage terminals. These should not be touched or a severe electric shock may be sustained.
- 2) Do not touch any switches with wet hands. This too, can produce an electric shock.

WARNING:

- 1) The emergency stop pushbutton switch location should be well known, so that it can be operated at any time without having to look for it.
- 2) Before replacing a fuse, turn off the main incoming power switch to the machine.
- 3) Provide sufficient working space to avoid hazardous falls.
- 4) Water or oil can make floors slippery and hazardous. All floors should be clean and dry to prevent accidents
- 5) Do not operated any switch without a thorough understanding of the actions about to be taken.
- 6) Avoid accidental operation of switches.
- 7) Work benches near the machine must be strong enough to hold materials placed on them to prevent accidents. Articles should be prevented from slipping off the bench surface.
- 8) If a job is to be done by two or more persons, coordinating signals should be given at each step of the operation. The next step should not be taken unless a signal is given and acknowledged.

CAUTION:

- 1) In the event of power failure, turn off the main circuit breaker immediately.
- 2) Use the recommended hydraulic oils, lubricants and grease or acceptable equivalents.
- 3) Replacement fuses should have the proper current ratings.
- 4) Protect the NC unit, operating panel, electric control panel, etc. from shocks, since this could cause a failure or malfunction.
- 5) Do not change parameters or electrical settings. If changes are unavoidable, record the values prior to the change so that they can be returned to their original settings, if necessary.

- 6) Do not deface, scratch or remove any caution plate. Should it become illegible or missing, order another caution plate from the supplier, specifying the part number shown at the lower right corner of the plate.

• BEFORE POWERING UP

DANGER:

Cables, cords or electric wires whose insulation is damaged can produce current leaks and electric shocks. Before using, check their condition.

WARNING:

- 1) Be sure the instruction manual and the programming manual are fully understood before operating the machine. Every function and operating procedure should be completely clear.
- 2) Use approved oil resistant safety shoes, safety goggles with side covers, safe clothes, and other safety protection required.
- 3) Close all NC unit, operating panel, electric control panel doors and covers.

CAUTION:

- 1) The power cable from the factory feeder switch to the machine main circuit breaker should have a sufficient sectional area to handle the electric power used.
- 2) Cables which must be laid on the floor must be protected from hot chips, by using rigid or other approved conduit, so that short-circuits will not occur.
- 3) Before first time operation of the machine after unpacking it or from being idle for a long period of time (several days or more), each sliding part must be sufficiently lubricated. To do so, push and release the pump button several times until the oil seeps out on the sliding parts. The pump button has a return spring, so do not force it to return.
- 4) Oil reservoirs should be filled to indicated levels. Check and add oil, if needed.
- 5) For lubrication points, oil specification and appropriate levels, see the various instruction plates.
- 6) Switches and levers should operate smoothly. Check that they do.
- 7) When powering the machine on, turn on the switches in the following order: first the factory feeder switch, then the machine main circuit breaker, and then the control power on switch located on the operating panel.
- 8) Check the coolant level, and add coolant, if needed.

• AFTER CONTROL POWER IS TURNED ON

CAUTION:

When the control power "ON" switch on the operating panel is on, the "READY" lamp on the operating panel should also be on (check to see that it is).

• ROUTINE INSPECTIONS

WARNING:

When checking belt tensions, do not get your fingers caught between the belt and pulley.

CAUTION:

- 1) Check pressure gages for proper readings.
- 2) Check motors, gear boxes and other parts for abnormal noises.
- 3) Check the motor lubrication, and sliding parts for evidence of proper lubrication.
- 4) Check safety covers and safety devices for proper operation.
- 5) Check belt tensions. Replace any set of belts that have become stretched with a fresh matching set.

• WARM UP

CAUTION:

- 1) Warm up the machine, especially the spindle and feed shaft, by running the machine for 10 to 20 minutes at about one-half or one-third the maximum speed in the automatic operation mode.
- 2) The automatic operation program should cause each machine component to operate. At the same time, check their operations.
- 3) Be particularly careful to warm up the spindle which can turn above 4000 rpm.

If the machine is used for actual machining immediately after being started up following a long idle period, the sliding parts may be worn due to the lack of oil. Also, thermal expansion of the machine components can jeopardize machining accuracy. To prevent this condition, always make sure that the machine is warmed up.

• PREPARATIONS

WARNING:

- 1) Tooling should conform to the machine specifications, dimensions and types.
- 2) Replace all seriously worn tools with new ones to prevent injuries.
- 3) The work area should be adequately lighted to facilitate safety checks.

- 4) Tools and other items around the machine or equipment should be stored to ensure good footing and clear aisles.
- 5) Do not place tools or any other items on the headstock, turret, covers and similar places (For T/M).

CAUTION:

- 1) Tool lengths should be within specified tolerances to prevent interference.
- 2) After installing a tool, make a trial run.

• OPERATION

WARNING:

- 1) Do not work with long hair that can be caught by the machine. Tie it back, out of the way.
- 2) Do not operate switches with gloves on. This could cause mis-operation.
- 3) Whenever a heavy workpiece must be moved, if there is any risk involved, two or more people should work together.
- 4) Only trained, qualified workers should operate forklift trucks, cranes or similar equipment and apply slings.
- 5) Whenever operating a forklift truck, crane or similar equipment, special care should be taken to prevent collisions and damage to the surroundings.
- 6) Wire ropes or slings should be strong enough to handle the loads to be lifted and should conform to the mandatory provisions.
- 7) Grip workpieces securely.
- 8) Stop the machine before adjusting the coolant nozzle at the tip.
- 9) Never touch a turning workpiece in the spindle with bare hands, or in any other way.
- 10) To remove a workpiece from the machine other than by a pallet changer, stop the tool and provide plenty of distance between the workpiece and the tool (for M/C).
- 11) While a workpiece or tool is turning, do not wipe it off or remove chips with a cloth or by hand. Always stop the machine first and then use a brush and a sweeper.
- 12) Do not operate the machine with the chuck and front safety covers removed (For T/M).
- 13) Use a brush to remove chips from the tool tip, do not use bare hands.
- 14) Stop the machine whenever installing or removing a tool.
- 15) Whenever machining magnesium alloy parts, wear a protective mask.

CAUTION:

- 1) During automatic operation, never open the machine door. Machines equipped with the door interlock will set the program to single step.
- 2) When performing heavy-duty machining, carefully prevent chips from being accumulated since hot chips from certain materials can cause a fire.

• **TO INTERRUPT MACHINING**

WARNING:

When leaving the machine temporarily after completing a job, turn off the power switch on the operation panel, and also the main circuit breaker.

• **COMPLETING A JOB**

CAUTION:

- 1) Always clean the machine or equipment. Remove and dispose of chips and clean cover windows, etc.
- 2) Make sure the machine has stopped running, before cleaning.
- 3) Return each machine component to its initial condition.
- 4) Check the wipers for breakage. Replace broken wipers.
- 5) Check the coolant, hydraulic oils and lubricants for contamination. Change them if they are seriously contaminated.
- 6) Check the coolant, hydraulic oil and lubricant levels. Add if necessary.
- 7) Clean the oil pan filter.
- 8) Before leaving the machine at the end of the shift, turn off the power switch on the operating panel, machine main circuit breaker and factory feeder switch in that order.

• **SAFETY DEVICES**

- 1) Front cover, rear cover and coolant cover.
- 2) Chuck barrier, tail barrier and tool barrier (NC software).
- 3) Stored stroke limit (NC software).
- 4) Emergency stop pushbutton switch.

• **MAINTENANCE OPERATION PREPARATIONS**

- 1) Do not proceed to do any maintenance operation unless instructed to do so by the foreman.
- 2) Replacement parts, consumables (packing, oil seals, O rings, bearing, oil and grease, etc.) Should be arranged in advance.
- 3) Prepare preventive maintenance and record maintenance programs.

CAUTION:

- 1) Thoroughly read and understand the safety precautions in the instruction manual.
- 2) Thoroughly read the whole maintenance manual and fully understand the principles, construction and precautions involved.

• **MAINTENANCE OPERATION**

DANGER:

- 1) Those not engaged in the maintenance work should not operate the main circuit breaker or the control power "ON" switch on the operating panel. For this purpose, "Do not Touch the Switch, Maintenance Operation in Progress!" or similar warning should be indicated on such switches and at any other appropriate locations. Such indication should be secured by a semi-permanent means in the reading direction.
- 2) With the machine turned on, any maintenance operation can be dangerous. In principle, the main circuit breaker should be turned off throughout the maintenance operation.

WARNING:

- 1) The electrical maintenance should be done by a qualified person or by others competent to do the job. Keep close contact with the responsible person. Do not proceed alone.
- 2) Overtravel limit and proximity switches and interlock mechanisms including functional parts should not be removed or modified.
- 3) When working at a height, use steps or ladders which are maintained and controlled daily for safety.
- 4) Fuses, cables, etc. made by qualified manufacturers should be employed.

• **BEFORE OPERATION & MAINTENANCE BEGINS**

WARNING:

- 1) Arrange things in order around the section to receive the maintenance, including working environments. Wipe water and oil off parts and provide safe working environments.
- 2) All parts and waste oils should be removed by the operator and placed far enough away from the machine to be safe.

CAUTION:

- 1) The maintenance person should check that the machine operates safely.
- 2) Maintenance and inspection data should be recorded and kept for reference.

**WARNING**

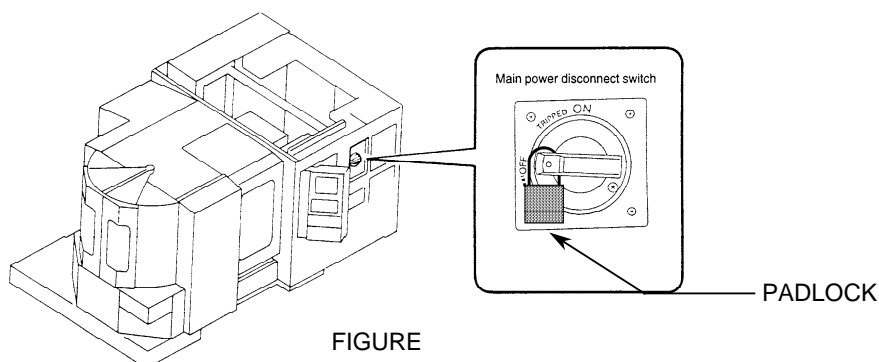
ALWAYS TURN THE MAIN CIRCUIT BREAKER TO THE “OFF” POSITION & USE AN APPROVED LOCKOUT DEVICE WHEN COMPLETING MAINTENANCE OR REPAIRS.

THE LOCKOUT PROCEDURE THAT FOLLOWS IS INTENDED TO SAFEGUARD PERSONNEL & EQUIPMENT DURING MAINTENANCE OPERATIONS, AND, REPRESENTS THE MINIMUM REQUIREMENTS. ANY ACTION SHOULD BE PRECEDED BY A “HAZARD ANALYSIS” TO DETERMINE ANY ADDITIONAL SAFETY PRECAUTIONS THAT MAY BE NECESSARY TO ENSURE THE SAFETY OF PERSONNEL AND EQUIPMENT.

NOTE: USE OF THE FOLLOWING LOCKOUT PROCEDURE IS MANDATORY WHEN COMPLETING MAINTENANCE OR REPAIRS.

LOCKOUT PROCEDURE

- 1) THE LOCKOUT PROCESS MUST BE PERFORMED BY AUTHORIZED PERSONNEL ONLY.
- 2) INFORM ALL EFFECTED PERSONNEL OF YOUR INTENT TO LOCKOUT AND SERVICE THE SPECIFIED MACHINE.
- 3) SHUT OFF MACHINE POWER USING NORMAL SHUT DOWN PROCEDURES.
- 4) TURN OFF THE MACHINE AND INDIVIDUAL BUILDING CIRCUIT BREAKERS. MAKE SURE ALL STORED ELECTRICAL ENERGY IS RELIEVED. (EG: SPINDLE & AXIS SERVO CONTROLLERS)
- 5) CONNECT THE LOCKOUT DEVICE AS SHOWN IN FIGURE 1, AND ATTACH THE APPROPRIATE TAG AT THE MACHINE CIRCUIT BREAKER. THE TAG MUST IDENTIFY THE PERSON RESPONSIBLE FOR THE LOCKOUT. THIS WILL ENSURE THAT POWER CANNOT BE RESTORED BY ANYONE ELSE.
- 6) TEST THE MACHINE TO VERIFY THAT MACHINE SYSTEMS DO NOT OPERATE IN ANY WAY. ONCE TESTING IS COMPLETE, MAKE SURE ALL SWITCHES ARE IN THE “OFF” POSITION. CONFIRM THAT THE LOCKOUT DEVICES REMAIN PROPERLY INSTALLED.
- 7) COMPLETE THE REQUIRED MAINTENANCE OPERATIONS.
- 8) MAKE SURE ALL PERSONNEL ARE CLEAR OF THE MACHINE.
- 9) REMOVE THE LOCKOUT DEVICE. MAKE SURE ALL PERSONNEL ARE AT A SAFE LOCATION BEFORE RESTORING MACHINE POWER.



FIGURE

INSTALLATION PRECAUTIONS

The following subjects outline the items that directly affect the machine installation and start-up. To ensure an efficient and timely installation, please follow these recommendations before calling to schedule a service engineer.

• ENVIRONMENTAL REQUIREMENTS

Avoid the following places for installing the machine:

- 1) Avoid exposure to direct sunlight and/or near a heat source, etc. Ambient temperature during operation: 0° thru 45°C (32°F to 113°F).
- 2) Avoid areas where the humidity fluctuates greatly and/or if high humidity is present; normally 75% and below in relative humidity. A higher humidity deteriorates insulation and might accelerate the deterioration of parts.
- 3) Avoid areas that are especially dusty and/or where acid fumes, corrosive gases and salt are present.
- 4) Avoid areas of high vibration.
- 5) Avoid soft or weak ground (**minimum load bearing capacity of 1025 lbs./ft²**)

• FOUNDATION REQUIREMENTS

For high machining accuracy, the foundation must be firm and rigid. This is typically accomplished by securely fastening the machine to the foundation with anchor bolts. In addition, the depth of concrete should be as deep as possible (minimum 6 - 8 inches). Note the following:

- 1) There can be no cracks in the foundation concrete or surrounding area.
- 2) Vibration proofing material (such as asphalt) should be put all around the concrete pad.
- 3) Form a "cone" in the foundation for J-bolt anchors, or use expansion anchors.
- 4) With the foundation anchor bolt holes open pour the primary **concrete at a minimum thickness of 6 - 8 inches**. Typically, the concrete must have a **minimum compression rating of 2500 lbs. @ 250 lbs. compression** and strengthened with reinforcing rods. When the concrete has cured, rough level the machine, and install the J-bolts, leveling blocks, etc., and pour grout into foundation bolt holes.
- 5) Mix an anti-shrinkage agent such as Denka CSA with concrete, or use Embeco grout to fill the foundation bolt holes.

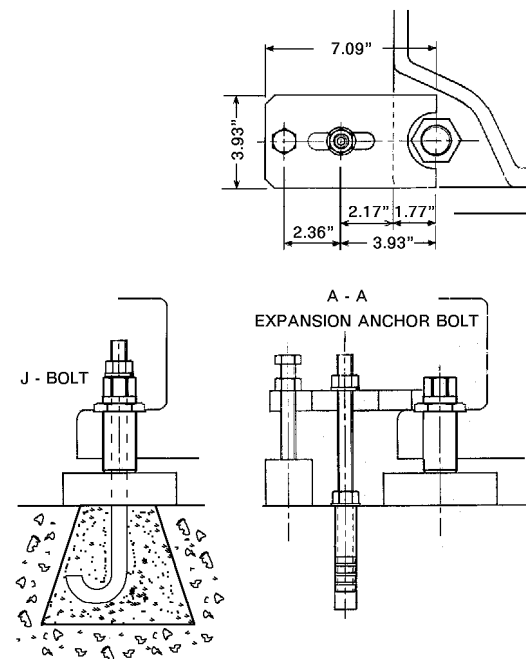
- 6) In pouring grout, fasten the leveling block base plates with the collar retaining screws to prevent the base plates from dropping. When the grout has completely hardened, level the machine properly, and tighten M24 nuts to secure the machine to the foundation.

Note:

The machine must be anchored to the foundation with J-bolts, expansion bolts or other suitable method.

The machine accuracy and alignment specifications quoted by Mazak can usually be obtained when the minimum foundation requirements are met. However, production of close tolerance parts requires the use of an appropriate certified foundation. Foundations that do not meet certified specifications may require more frequent machine re-leveling and re-alignment, which can not be provided under terms of warranty.

If any of these conditions cannot be met, contact the nearest Mazak service office immediately.



TYPICAL MACHINE HOLD DOWN OPTIONS

• WIRING

- 1) Use only electrical conductors with performance ratings equivalent or superior.
- 2) Do not connect any power cables for devices which can cause line noise to the power distribution panel, such as arc welders and high frequency machinery.
- 3) Arrange for a qualified electrician to connect the power lines.
- 4) Incoming supply voltage should not deviate more than $\pm 10\%$ of specified supply voltage.
- 5) Source frequency should be ± 2 Hz of nominal frequency.

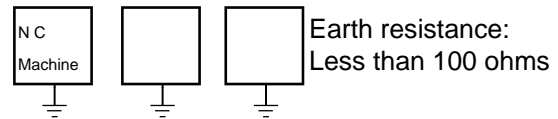
[CAUTION]

VERIFY THE ACTUAL MACHINE ELECTRICAL POWER REQUIREMENT AND THE MAIN TRANSFORMER RATING (IF APPLICABLE), AS WELL AS THE LOCAL ELECTRICAL CODE BEFORE SIZING AND INSTALLING THE INCOMING POWER WIRING. PLEASE SEE THE ADDITIONAL CAUTIONS ON THE FOLLOWING PAGE.

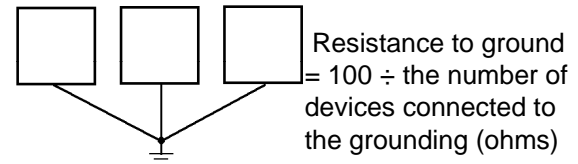
• GROUNDING

- 1) An isolated earth ground with a resistance to ground of less than 100 ohms is required. Typically, a 5/8" copper rod, 8 feet long, and no more than 5 feet from the machine, is sufficient. Building grounds or multiple machines grounded to the same ground rod, are not acceptable.
- 2) The wire size should be greater than AWG (American Wire Gauge) No. 5 and SWG (British Legal Standard Wire Gauge) No. 6.

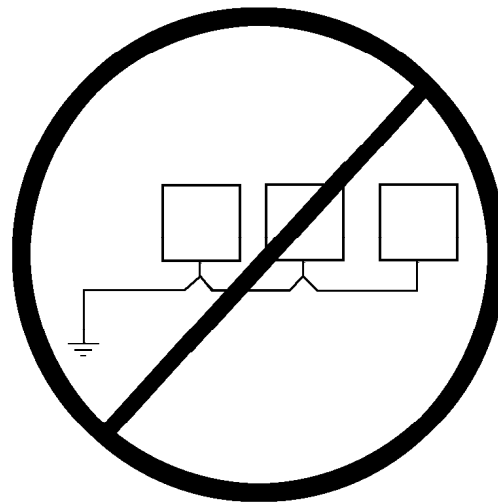
Desirable Independent Grounding:



Common Grounds:



Note: Never ground equipment as shown below:



**CAUTION**

A step-down transformer is optional on some machine models. Be certain to verify the transformer Kva rating (where applicable), as well as local electrical code requirements before sizing and installing the incoming power wiring.

Machines not equipped with a main transformer are wired for 230 VAC, 3 phase. The end user must supply a step-down transformer where factory electrical power varies more than $\pm 10\%$ of the 230 VAC rating.

NOTE:

Step-down or voltage regulating transformers are external (peripheral) to the machine tool and are considered the primary input line (source) for the machine. Local electrical code or practice may require a circuit breaker or other switching device for the isolation of electrical power when this type of transformer is used. In such cases, the machine tool end user is required to supply the necessary circuit breaker or switching device.

FAILURE TO COMPLY CAN RESULT IN PERSONAL INJURY AND DAMAGE TO THE MACHINE. IF ANY QUESTION EXISTS, CONTACT THE NEAREST MAZAK SERVICE CENTER FOR ASSISTANCE.

**WARNING**

MAZATROL CNC CONTROLLERS PROVIDE PARAMETER SETTINGS TO LIMIT SPINDLE RPM. THESE SETTINGS ARE BASED ON THE MAXIMUM SPEED SPECIFIED BY THE CHUCK/ACTUATOR MANUFACTURER.

MAKE SURE TO SET THESE PARAMETERS ACCORDING TO CHUCK SPECIFICATION WHEN INSTALLING A CHUCKING PACKAGE. ALSO, STAMP THE MAXIMUM SPINDLE RPM ON THE CHUCK IDENTIFICATION PLATE LOCATED ON THE MACHINE TOOL COVERS.

REFERENCE THE CNC PARAMETER MANUAL SUPPLIED WITH THE SPECIFIC MACHINE TOOL TO IDENTIFY THE REQUIRED PARAMETERS TO CHANGE.

FAILURE TO COMPLY WITH THESE INSTRUCTIONS COULD RESULT IN DAMAGE TO THE MACHINE, SERIOUS INJURY OR DEATH.

IF ANY QUESTIONS EXIST, CONTACT THE NEAREST MAZAK SERVICE CENTER FOR ASSISTANCE.

**WARNING**

MAZAK MACHINES ARE ENGINEERED WITH A NUMBER OF SAFETY DEVICES TO PROTECT PERSONNEL AND EQUIPMENT FROM INJURY AND DAMAGE.

DO NOT REMOVE, DISCONNECT, BYPASS OR MODIFY ANY LIMIT SWITCH, INTERLOCK, COVER, OR OTHER SAFETY FEATURE IN ANY WAY, EITHER MECHANICALLY OR ELECTRICALLY.

FAILURE TO COMPLY WITH THESE INSTRUCTIONS COULD RESULT IN DAMAGE TO THE MACHINE, SERIOUS INJURY OR DEATH.

IF ANY QUESTIONS EXIST, CONTACT THE NEAREST MAZAK SERVICE CENTER FOR ASSISTANCE.

**WARNING**

MAZAK MACHINES ARE ENGINEERED WITH A NUMBER OF SAFETY DEVICES TO PROTECT PERSONNEL AND EQUIPMENT FROM INJURY AND DAMAGE.

MACHINE OPERATOR DOORS AND COVERS ARE DESIGNED TO WITHSTAND ACCIDENTAL IMPACT OF A BROKEN INSERT WHERE A MAXIMUM WEIGHT INSERT AT MAXIMUM TOOL DIAMETER IS RUNNING AT MAXIMUM SPINDLE RPM

NEVER USE A CUTTING TOOL OR TOOL INSERT THAT EXCEEDS MACHINE SPECIFICATIONS OR THAT OF A SPECIFIC TOOL HOLDER ITSELF, WHICHEVER IS LESS. THIS RESTRICTION APPLIES TO DIAMETER, WEIGHT, MAXIMUM SPINDLE RPM, MAXIMUM CUTTING TOOL ROTATION SPEED, ETC.

FOR COMPLETE SPECIFICATIONS, MAKE SURE TO REFERENCE OPERATION, MAINTENANCE AND DETAIL SPECIFICATION DOCUMENTATION SUPPLIED WITH THE MACHINE AND BY THE TOOLING MANUFACTURER.

NOTE: THE MAXIMUM INSERT WEIGHT FOR MAZAK MACHINES IS 20 gf. (0.04 lbs.).

FAILURE TO COMPLY WITH THESE INSTRUCTIONS COULD RESULT IN DAMAGE TO THE MACHINE, SERIOUS INJURY OR DEATH.

IF ANY QUESTIONS EXIST, CONTACT THE NEAREST MAZAK SERVICE CENTER FOR ASSISTANCE.

**WARNING**

BEFORE STARTING OPERATION, CHECK THAT THE WORKPIECE IS SECURELY MOUNTED IN A VISE OR A SUITABLE FIXTURE. BE CERTAIN THAT THE MOUNTING IS SUFFICIENT TO WITHSTAND CUTTING FORCES DURING WORKPIECE MACHINING.

FAILURE TO COMPLY WITH THESE INSTRUCTIONS COULD RESULT IN DAMAGE TO THE MACHINE, SERIOUS INJURY OR DEATH.

IF ANY QUESTIONS EXIST, CONTACT THE NEAREST MAZAK SERVICE CENTER FOR ASSISTANCE.

**WARNING**

CONFIRM PROPER WORKPIECE FIXTURING/CLAMPING, TOOL SETUP AND THAT THE MACHINE DOOR IS SECURELY CLOSED BEFORE THE START OF MACHINING.

VERIFY ALL SAFETY PRECAUTIONS OUTLINED IN THIS MANUAL BEFORE USING THE FOLLOWING CUTTING CONDITIONS:

- CUTTING CONDITIONS THAT ARE THE RESULT OF THE MAZATROL FUSION 640 AUTOMATIC CUTTING DETERMINATION FUNCTION
- CUTTING CONDITIONS SUGGESTED BY THE MACHINING NAVIGATION FUNCTION
- CUTTING CONDITIONS FOR TOOLS THAT ARE SUGGESTED TO BE USED BY THE MACHINING NAVIGATION FUNCTION

FAILURE TO COMPLY WITH THESE INSTRUCTIONS COULD RESULT IN DAMAGE TO THE MACHINE, SERIOUS INJURY OR DEATH.

IF ANY QUESTIONS EXIST, CONTACT THE NEAREST MAZAK SERVICE CENTER FOR ASSISTANCE.

DOOR INTERLOCK SAFETY SPEC.

Determined by YMW Eng. H.Q. '99/9/1
Revised by YMC Prod. Eng. '99.10.28

MACHINING CENTER

DOOR	MODE	SET UP SWITCH	
		O (OFF)	I (ON)
OPEN	MANUAL	Prohibit to move axis. Prohibit to start spindle running. Prohibit to operate manual ATC. Prohibit to operate manual Pallet Changer. Prohibit to run chip spiral conveyor.	Limit the rapid override. Max is 12%. Prohibit to run chip spiral conveyor. Can run spindle JOG. Can run spindle Orient. Can operate manual ATC.
	AUTO	Prohibit cycle start. Prohibit to run chip spiral conveyor.	Prohibit cycle start. Prohibit to run chip spiral conveyor.
CLOSE I V OPEN	MANUAL	Door is always locked. Door lock can be released by pushing "DOOR UNLOCK SW" on operator panel. But, it can not release in operating ATC/Pallet changer/Axis/Spindle.	
		Prohibit to move axis. Prohibit to start spindle running. Prohibit to operate manual ATC. Prohibit to operate manual Pallet Changer. Prohibit to run chip spiral conveyor.	Limit the rapid override. Max is 12%. Chip spiral conveyor would stop. Can run spindle JOG. Can run spindle Orient. Can operate manual ATC.
	AUTO	Door is always locked. Door lock can be released by pushing "DOOR UNLOCK SW" on operator panel. But, it can not release in auto operation running except single block stop or feed hold stop or M00 program stop or M01 optional stop and spindle stop . If not, Alarm displayed "Door open invalid".	
		If release the lock by note(*1), Alarm will occur then stop the all motion. Chip spiral conveyor would stop.	Prohibit cycle start. Chip spiral conveyor would stop.
CLOSE	MANUAL	No Limitation.	No Limitation.
	AUTO	No Limitation.	Can not run auto operation.

TURNING CENTER

DOOR	MODE	SET UP SWITCH	
		O (OFF)	I (ON)
OPEN	MANUAL	Can operate CHUCK, TAILSLEEVE , STEADY REST for Loading workpiece. Can NOT operate Spindle, Axis, Turret, Coolant, ToolEye, Partscatcher, Chip Conveyor.	Can operate CHUCK, TAILSLEEVE , STEADY REST for Loading workpiece. Can not operate Spindle running, but Can operate Spindle JOG and Spindle Orient. Limitation of speed for axis movement . (Override is 10% max.) 1 step index only for turret.
	AUTO	Can operate CHUCK, TAILSLEEVE , STEADY REST for Loading workpiece. Can not run Auto-operation.	Can operate CHUCK, TAILSLEEVE , STEADY REST for Loading workpiece. Can not run Auto-operation.
CLOSE -> OPEN	MANUAL & AUTO	Can not open the front door in Spindle running, Axis moving, Auto-running(Cycle start, Feed hold) due to Mechanical locking system. (Except Single Block Stop or M00 program stop or M01 optional stop) But, if release the lock by note(*1), Alarm will occur then stop the all motion.	
CLOSE	MANUAL	No Limitation.	No Limitation.
	AUTO	No Limitation.	Can not run Auto-operation.

*1 : Door lock mechanism can not be released in machine stop by NC power OFF.

If it is necessary to release the lock such as emergencies, the lock can be released by operating the supplementary lock release mechanism of the main body of the safety door lock switch.

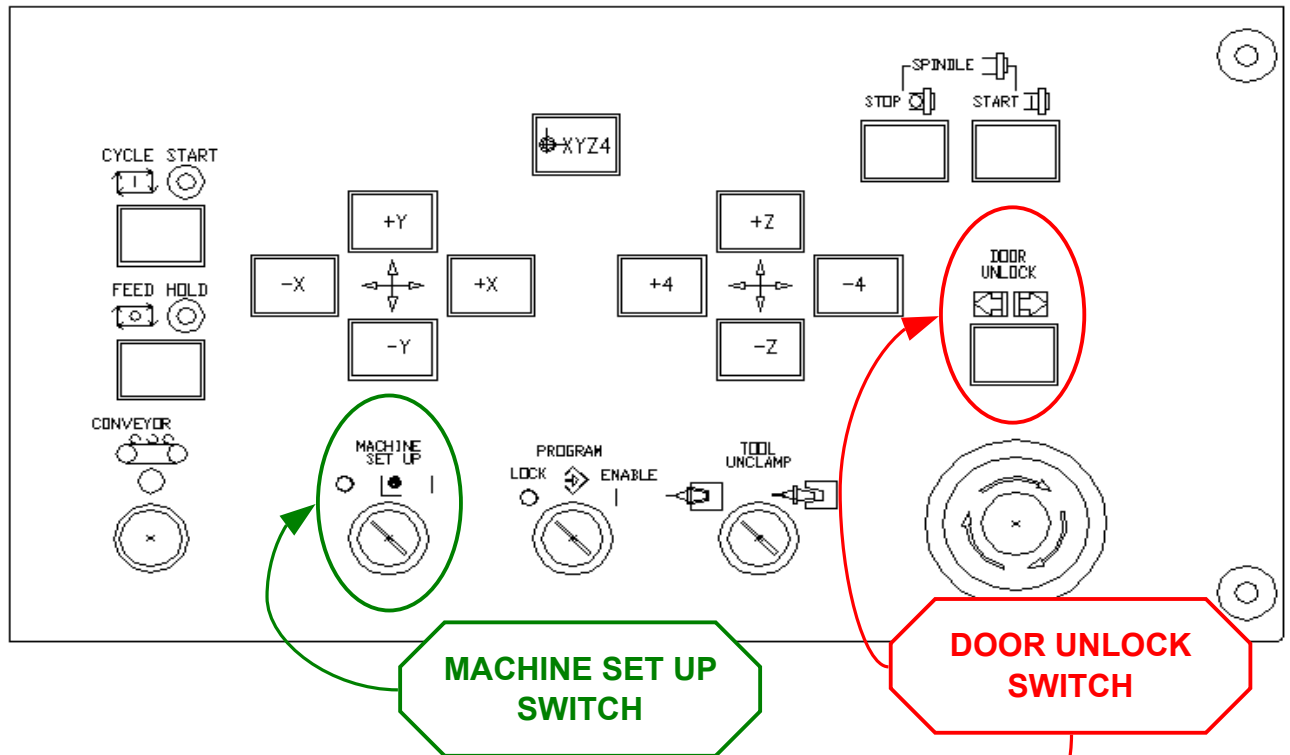
*2 : Override Limitation of Rapid speed of AXIS

Machining Center : 12%. Turning Center : 10%.

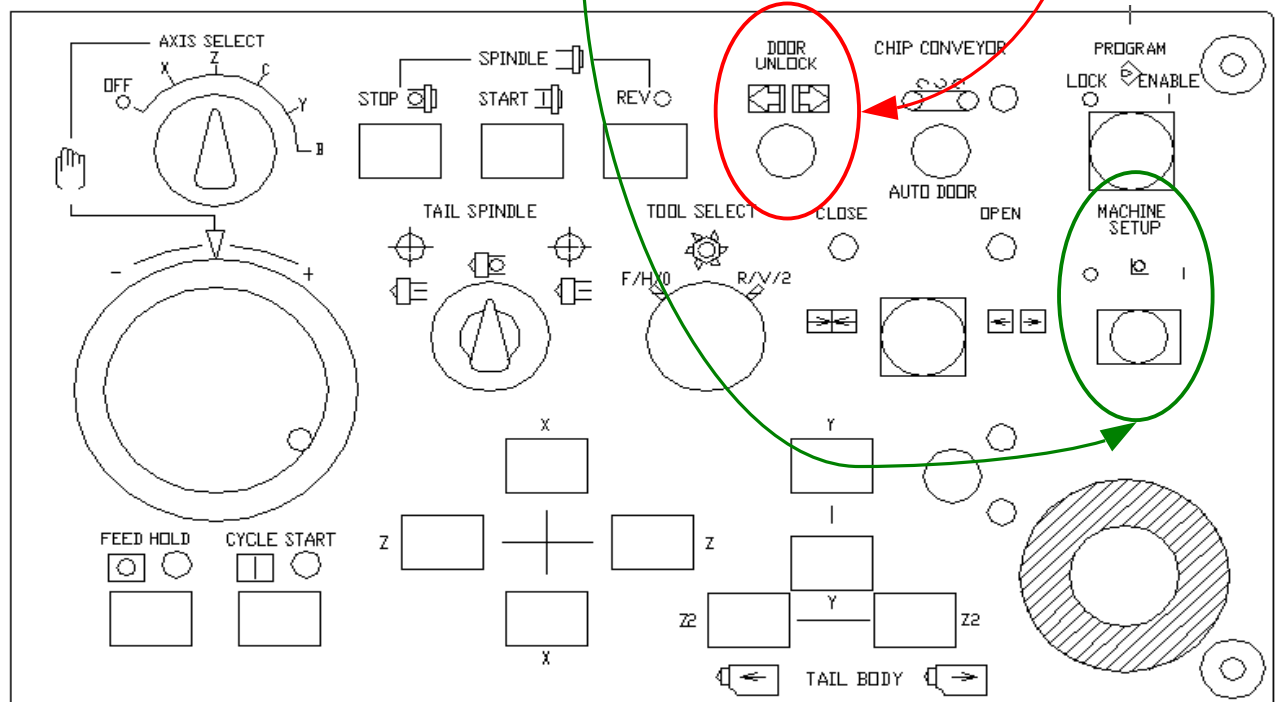
*3 : Chip Conveyor and Coolant should stop in the door open.

APPENDIX

SWITCH PANEL for M640M (Machining Center)



SWITCH PANEL for M640MT/T (Turning Center)





The Other Thoroughbred From Kentucky

*Your opinion is important to enable us to issue documentation that will fit your needs.
Thank you for taking the time to supply this information.*

Date: _____

Machine Type: _____ Machine Serial#: _____ NC Type: _____

Customer: _____ Reported By: _____

Address: _____ Position: _____

Telephone#: _____

Manual Publication #: _____ Excellent Good Adequate Fair Poor

How well is the documentation suited to your needs? ☐ ☐ ☐ ☐ ☐

Were you able to find the necessary information easily? ☐ ☐ ☐ ☐ ☐

How well are the manuals organized? ☐ ☐ ☐ ☐ ☐

How easy are the manuals to understand? ☐ ☐ ☐ ☐ ☐

Are the illustrations helpful? ☐ ☐ ☐ ☐ ☐

Overall, how do you rate the documentation? ☐ ☐ ☐ ☐ ☐

What did you like about the documentation? How can it be improved?

[illegible]

RETURN TO: MAZAK Corporation
Technical Publication Dept.
8025 Production Drive
Florence, Kentucky 41042

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Notes:

Questions arise as to what can be read into M640 control.

Below shows for the M640T, **not** M640MT control.

It is **impossible** to upload any Mazatrol programs to the M640MT from T32,Tplus, or M640T.

Note: It is impossible to save from any M640 control and load a Mazatrol program to earlier control type.

M640T

- 1) Loading Mazatrol programs via CMT to M640T.
 - A) From T32 -- Impossible
 - B) From Tplus- Possible, some edit may be necessary.
- 2) Loading Mazatrol programs via Computer I/O to M640T.
 - A) From T32 – Impossible, computer I/O doesn't exist for T32.
 - B) From Tplus – Possible, however, upgrade to B2 software.
See M640_Data_Xfer_3Digit_For_M640T.doc for more information.
- 3) Loading Mazatrol programs via DcCode control to M640T.
 - A) From T32,TPlus --- Impossible

M640M – Machining center control.

- 1) Loading Mazatrol programs via CMT to M640M.
 - A) From M32,M32B,M32A -- Impossible
 - B) From Mplus- Possible, some edit may be necessary.
- 2) Loading Mazatrol programs via Computer I/O to M640M.
 - A) From M32,M32B,M32A – Impossible, computer I/O doesn't exist for M32 series.
 - B) From Mplus – Possible, some edit on CNC may be necessary.
See M640_Data_Xfer_3Digit_For_M640M.doc for more information.
- 3) Loading Mazatrol programs via DcCode control to M640M.
 - A) From M32,M32A,M32B or Mplus --- Impossible

M640 Data Xfer 3Digit For M640T, *revised 11/03/1999*

For M640MT and T, B2c gives the user the capability to save programs in 3-digit G-code format.

Note: To upload Tplus programs saved in Computer I/O format, see Appendix-A at end of this procedure.

First, update to B2c(Main-B,369W001-B2c) or greater.

Next, set parameter P105 bit 6 to 1 (Example: P105: 0100 0000)

Keep the other bits same setting.

To Save:

- 1) Select Data I/O.
- 2) Press HardDisk and then Dir Select and enter in directory.
- 3) Press NC -> HD Save.
- 4) Press Text Format to highlight button. Leave alone if highlighted.
- 5) Select data to save and press Start.
- 6) If you wish to change to different folder than T_Backup/Other, select "Setup" and enter in the new path(see figure 1).

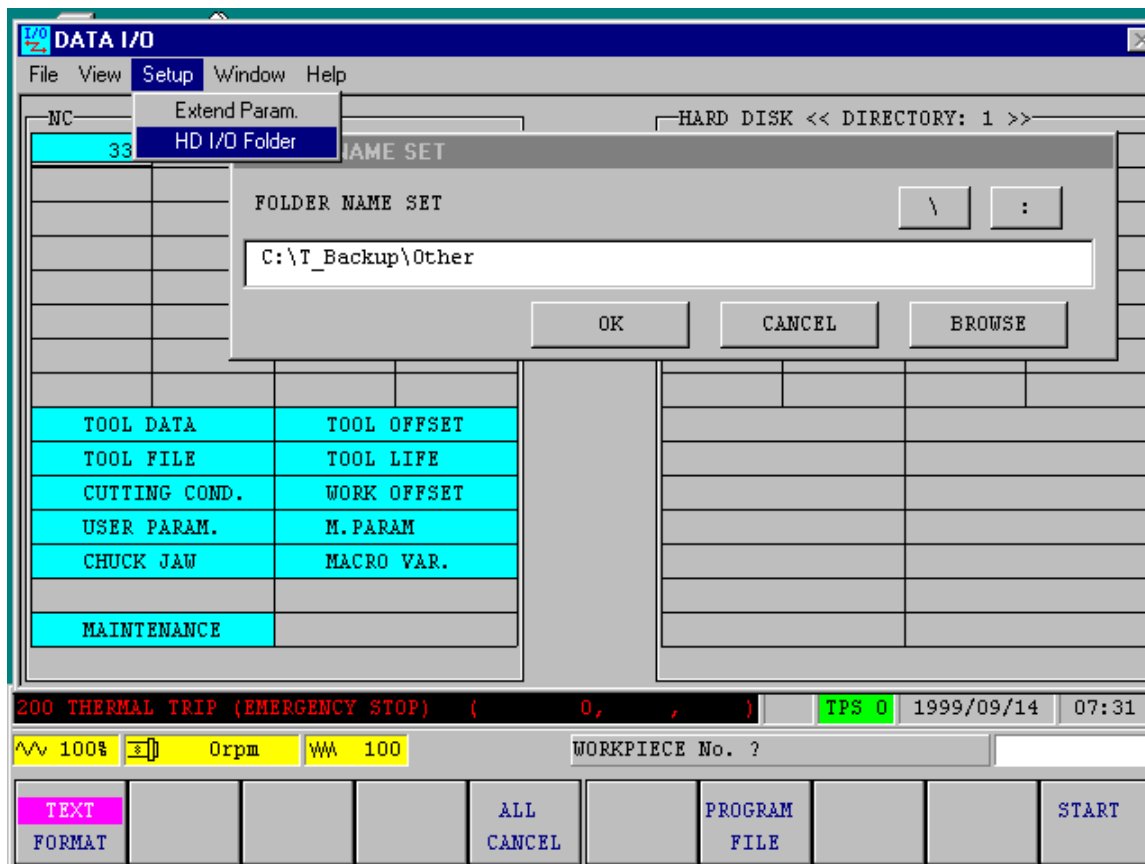


figure 1 Shows where Text Format button was added. If you wish to view the actual saving of each file, go to “View” and click on “I/O Status”.

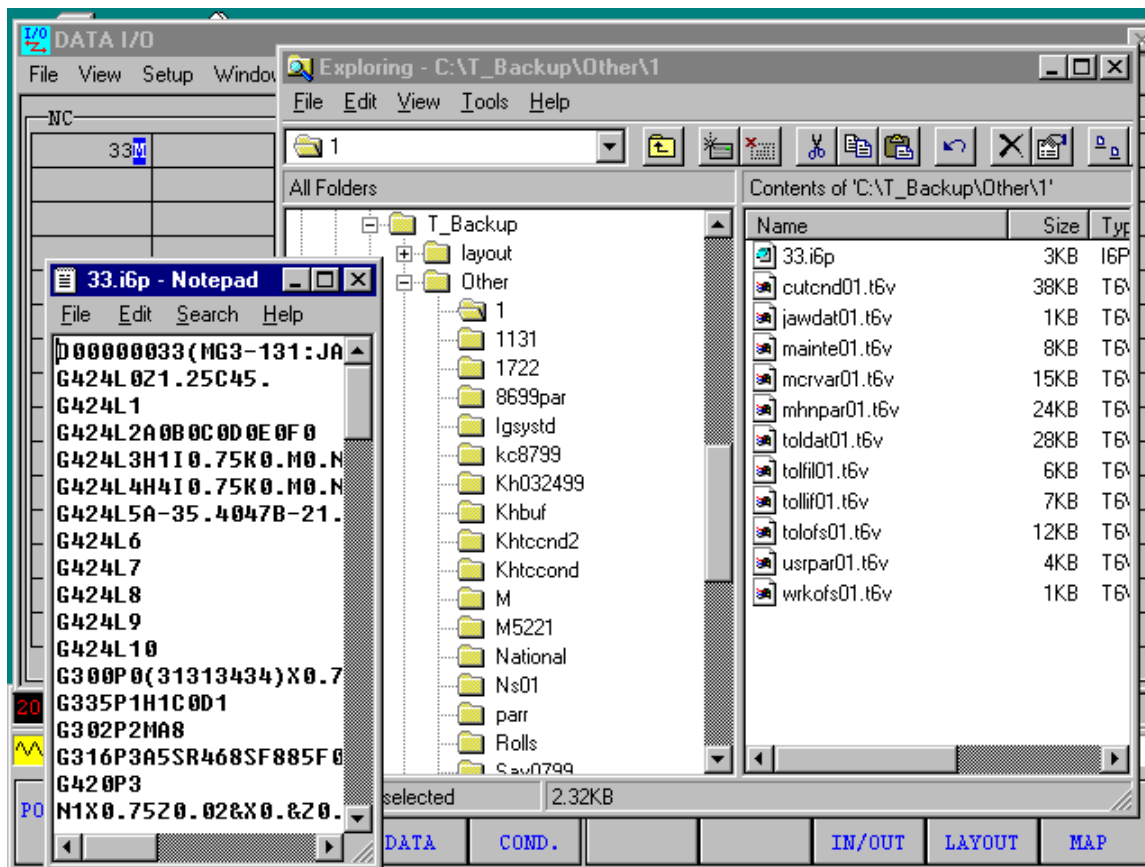


figure2 Shows 3-digit format of the saved program data. Taken from an Igx200sy on a MT control. Filename suffix is T6p for M640T control.

APPENDIX A

1) The Tplus programs will normally have a .txt or .maz extension for Ethernet saved. Change to .t6p extension after doing following changes.

Note: You cannot use .i6p as this is for a M64O MT controlled machine and no Tplus is equivalent.

2) When editing, the files may be too big to use NotePad. Use an Ascii file editor like TextPad32(www.textpad.com). It can handle large Ascii files. Do not use WordPad or Word as they can insert garbage and WordPad will cut off a large file without alerting you to this fact.

3) Delete % from beginning of program. In some cases you may need to remove program number, and description in parenthesis.

4) Save the file with .T6p extension and put into the directory selected above or create Test directory in c:\T_Backup\Other\Test. Or you can put on a floppy in a given directory. Or you can use Browse button and go to an external computer if part of Network.

Do not put directly into c:\T_Machine Programs.

Programs must go thru control(Data I/O) and into this directory.

5) Go to the NC side and thru use of DATA I/O load the file(s) into the NC. Select directory you saved them into. You will only see directories under c:\T_Backup\Other\ if select Hard Drive. If file is saved on floppy, use the Floppy and select directory.

Note: When saving a file to a directory, ***the control will first Delete any other files in that directory***, just saving in CMT mode. So create a new directory if saving new files.

M640 Data Xfer 3Digit For M640M, *revised 11/03/1999*

For M640M, Main-B B2a gives the user the capability to save programs in 3-digit G-code format.

To read an existing MPlus program saved via Computer I/O or Ethernet 3-digit mode, some small changes may be needed. See Appendix A at end of this procedure.

First, update to B2a(Main-B,360W001-B2a) or greater.
Next, set parameter F82 bit 7 to 1 (Example: F82: 1000 0000)
Keep the other bits same setting.

To Save:

- 1) Select Data I/O.
- 2) Press HardDisk and then Dir Select and enter in directory.
- 3) Press NC -> HD Save.
- 4) Press Text Format to highlight button. Leave alone if highlighted.
- 5) Select data to save and press Start.
- 6) If you wish to change to different folder than M_Backup/Other, select "Setup" and enter in new path(see figure1).

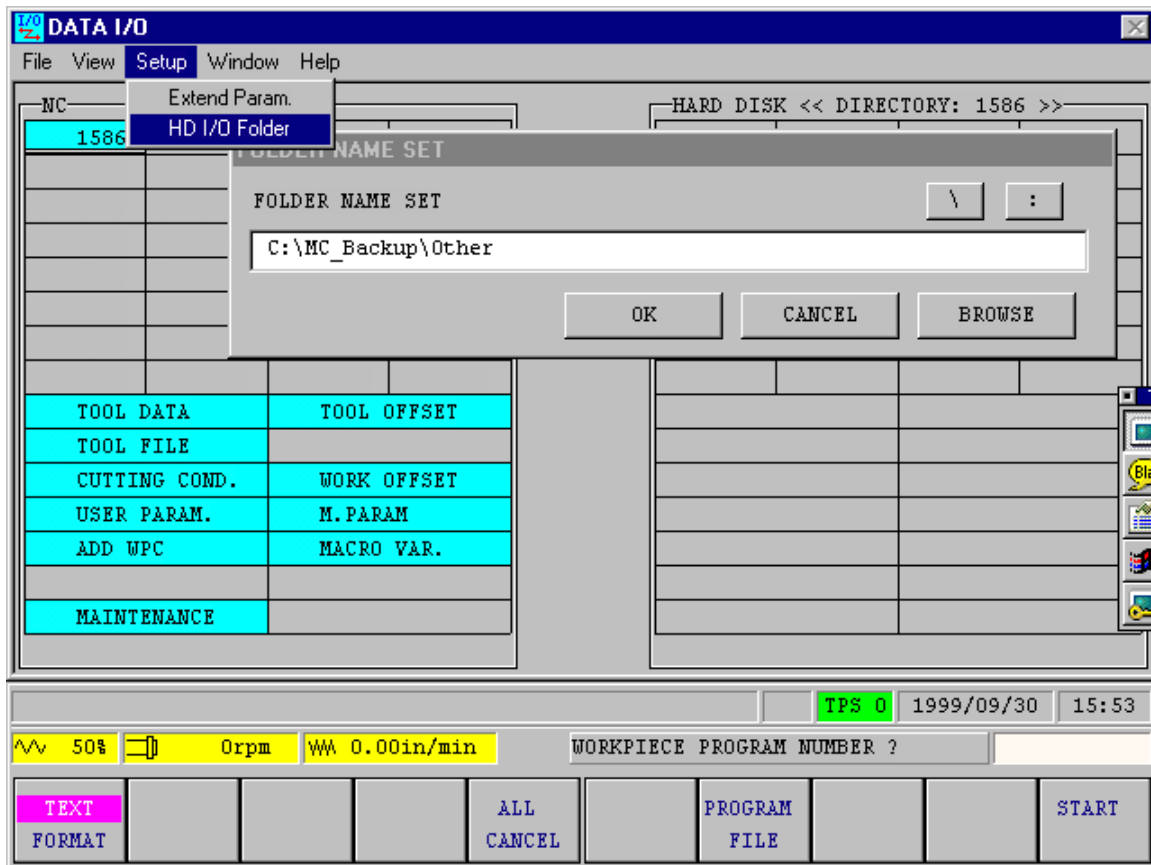


figure 1 Shows where Text Format button was added. If you wish to view the actual saving of each file, go to “View” and click on “I/O Status”.

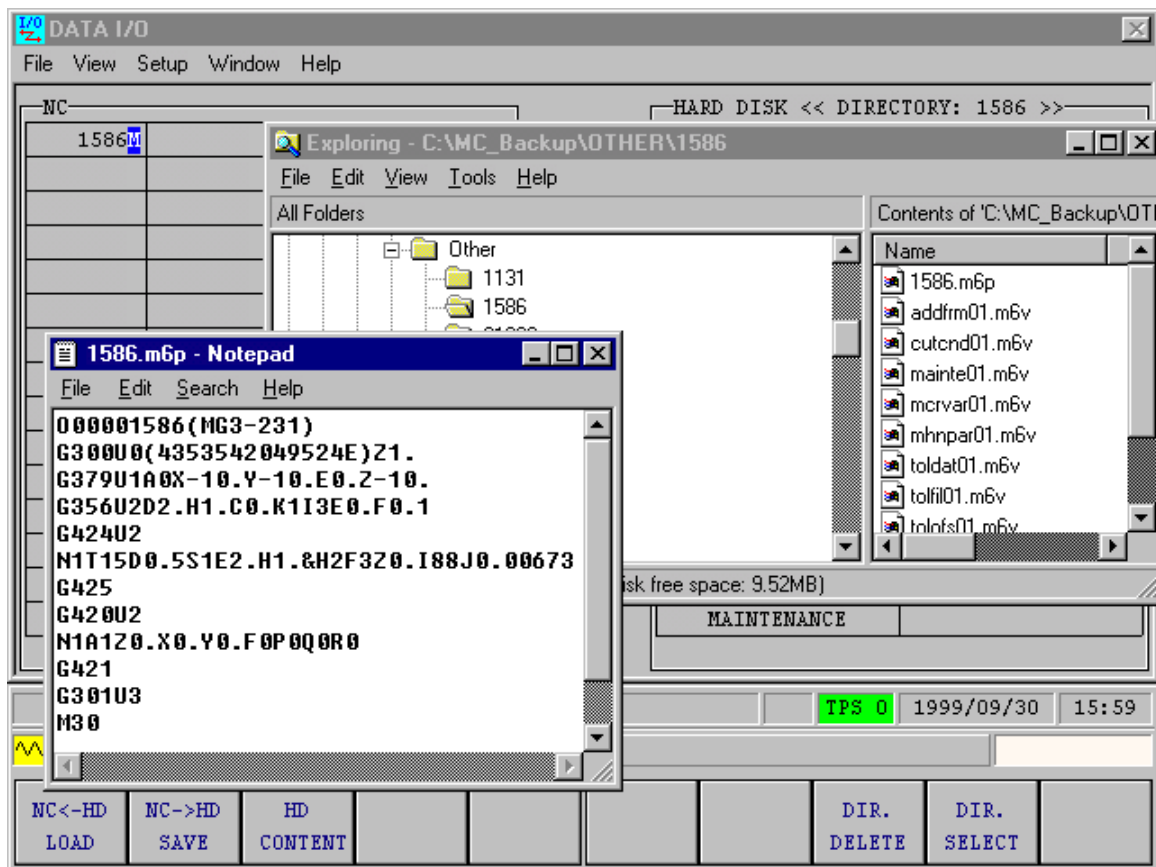


figure2 Shows 3-digit format of the saved program data. Taken from an M640M control.

APPENDIX A

- 1) The Mplus programs will normally have a .txt or .maz extension for Ethernet saved. Change to .m6p extension after doing following changes.
- 2) When editing, the files may be too big to use NotePad. Use an Ascii file editor like TextPad32(www.textpad.com). It can handle large Ascii files. Do not use WordPad or Word as they can insert garbage and WordPad will cut off a large file without alerting you to this fact.
- 3) Delete % from beginning of program. In some cases you may need to remove program number, and description in parenthesis.
- 4) Save the file with .M6p extension and put into the directory selected above or create Test directory in c:\MC_Backup\Other\Test. Or you can put on a floppy in a given directory. You can also use the Browse button for Network.
***Do not put directly into c:\MC_Machine Programs.
Programs must go thru control(Data I/O) and into this directory.***
- 5) Go to the NC side and thru use of DATA I/O loaded the file(s) into the NC. Select directory you saved them into. You will only see directories under c:\MC_Backup\Other\ if select Hard Drive. If file is saved on floppy, use the Floppy and select directory.

Note: When saving a file to a directory, ***the control will first Delete any other files in that directory***, just saving in CMT mode. So create a new directory if saving new files.

Quick Reference Guide Hyper Terminal Setup

(The Underlined text below are Hyper Links. Click on them to jump to that section)

1. [Beginning of Hyper Terminal Setup Procedure.](#)
2. [Cable Configurations](#)
3. [Fusion Parameter Setup](#)
4. [Mplus Parameter Setup](#)
5. [Tplus Parameter Setup](#)
6. [TroubleShooting Tips](#)

WARNING!!!!!!!!!!!!!!

THE VERSION OF HYPERTERMINAL THAT SHIPS WITH ALL VERSIONS OF WINDOWS 95 HAS PROBLEMS WITH ASCII FILE TRANSFERS. BEFORE YOU START THIS PROCEDURE YOU SHOULD DOWNLOAD THE FREE UPGRADE AT

<http://www.winmag.com/software/1997/0701/07share.htm#a2>

IF YOU HAVE THE LATEST VERSION THE GLOBE ON THE HILGRAEVE LOGO WINDOW THAT POPS UP WHEN YOU START HYPERTERMINAL WILL ROTATE.

Hyperterminal For Windows95 To Mazatrol Control Setup

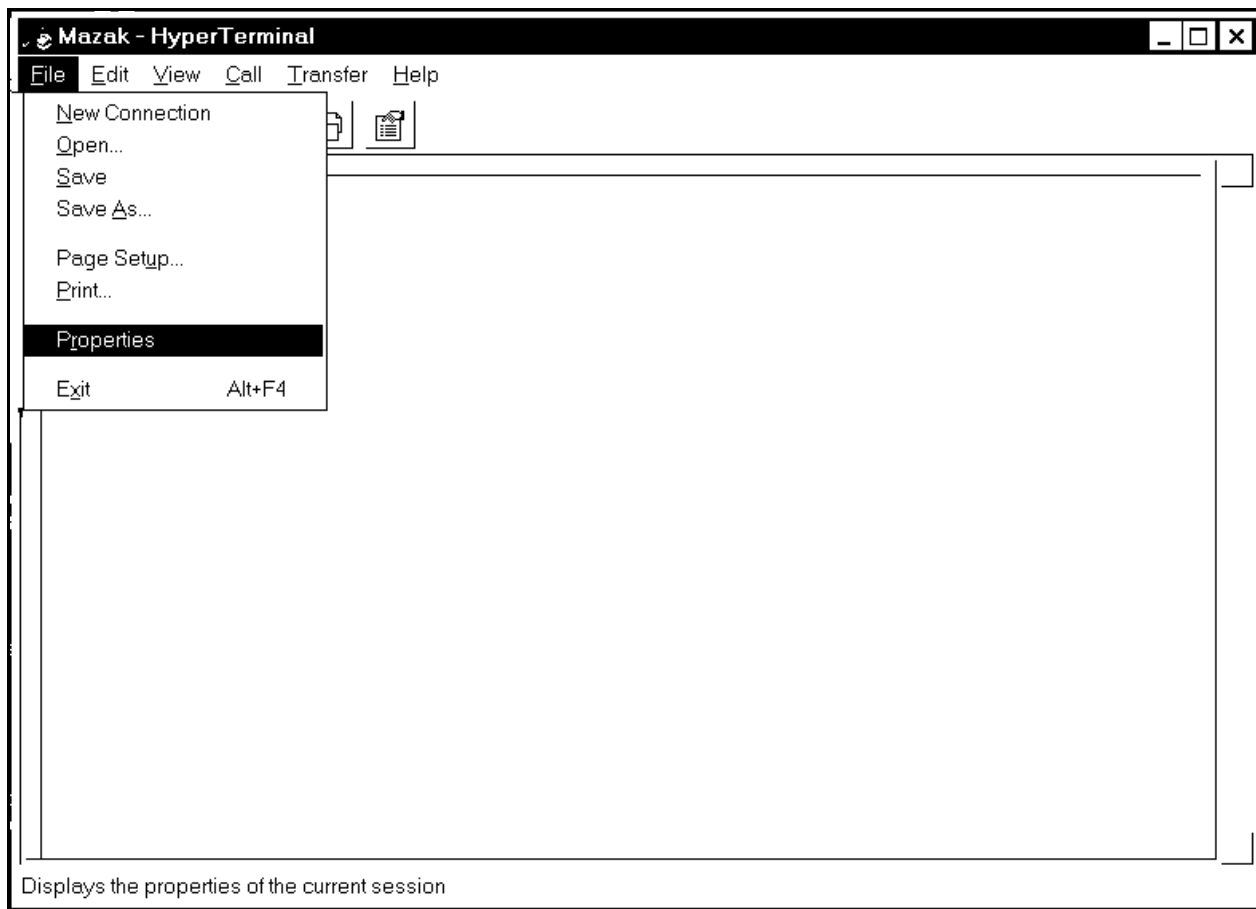
Select Properties

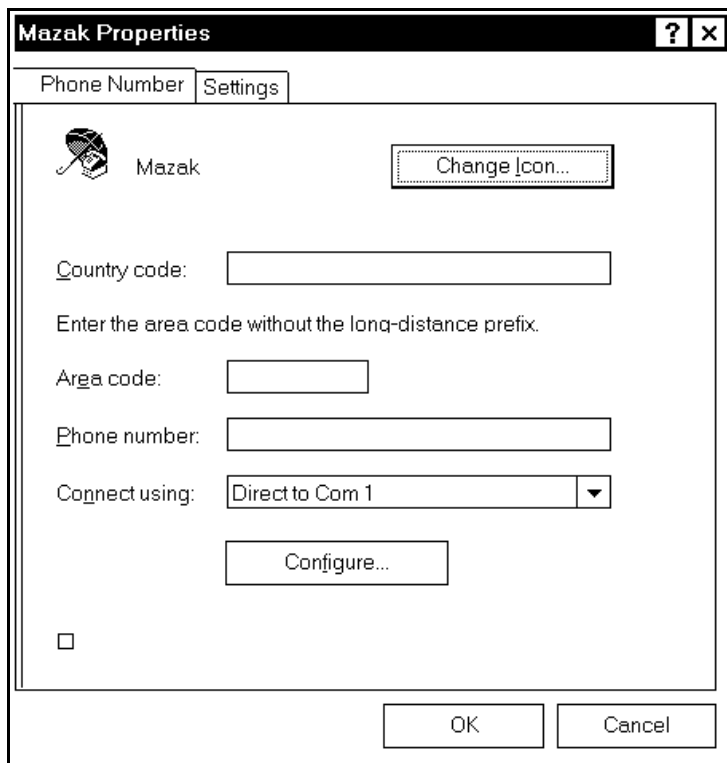
Properties will allow you to set the Hyper Terminal communications settings to work properly with the Mazak Machine Tool.

You will need to know some information about your computer before going any further with the setup. A few points are as follows:

Where are the serial ports on your computer? Computers have a (9-pin port) or a (25-pin port) and both are male connectors. Many people confuse the parallel port with the serial. The parallel port is a female port.

Is the serial port free to be used? Many times a mouse may be connected to the port or an internal modem may be set to that port number (COM1 or COM2).



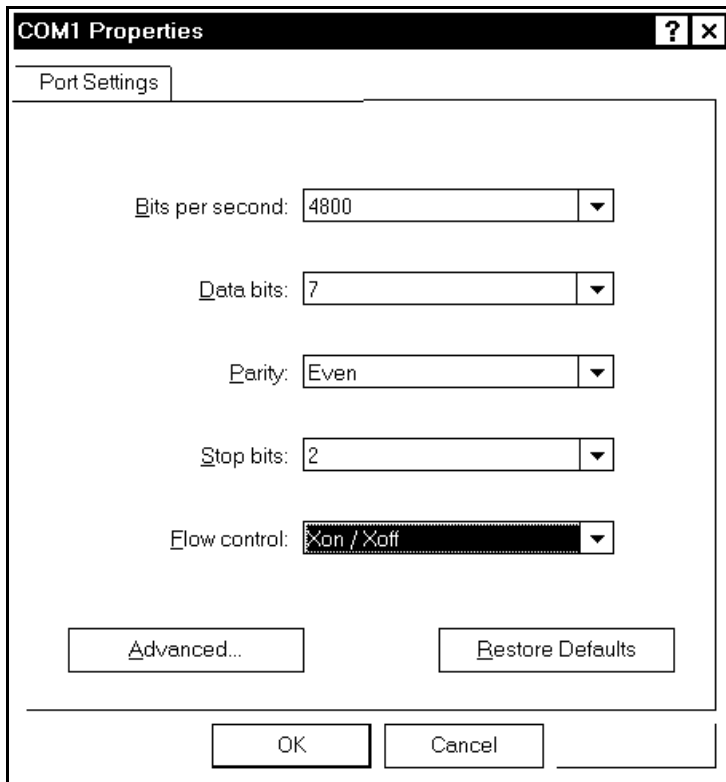


Select the Port

The port must be free to be used. Conflicts with a mouse driver or other devices can cost you a lot of time.

Selecting the speed that the computer will transfer

Click the "Configure" button, and you will see the following screen.....

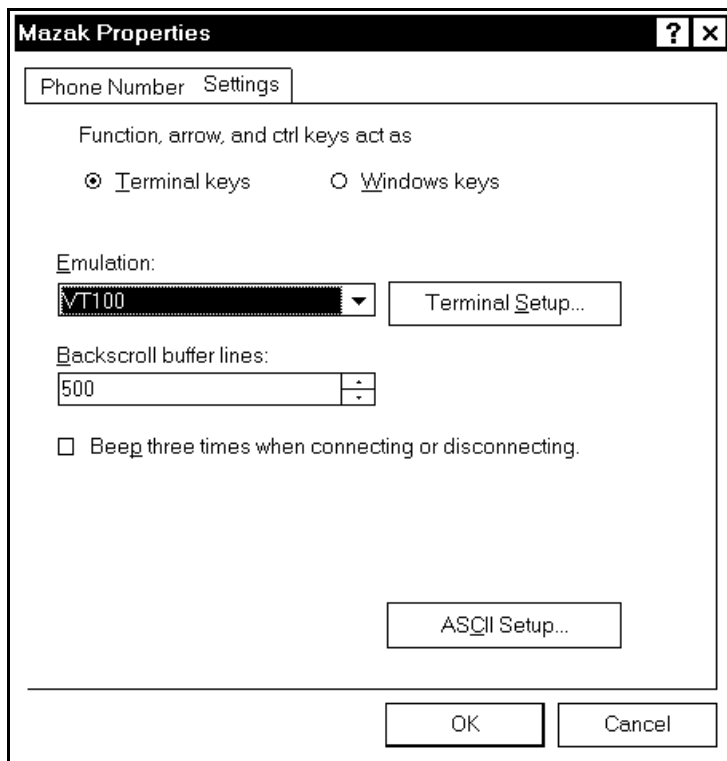


Select the same settings as above and click "OK".

You have now told your computer the speed of the port. The computer settings are not the same as those of the machine. The computer is set to (7) data bits and the machine is set to (8) data bits.

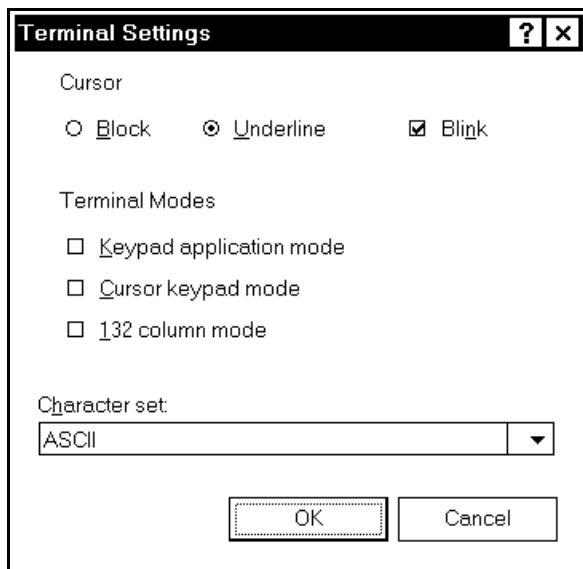
Selecting terminal settings

The next step is to tell Hyper Terminal how to format the programs that it will be sending or capturing. This is done through the Settings window, which you will see on the next page.....



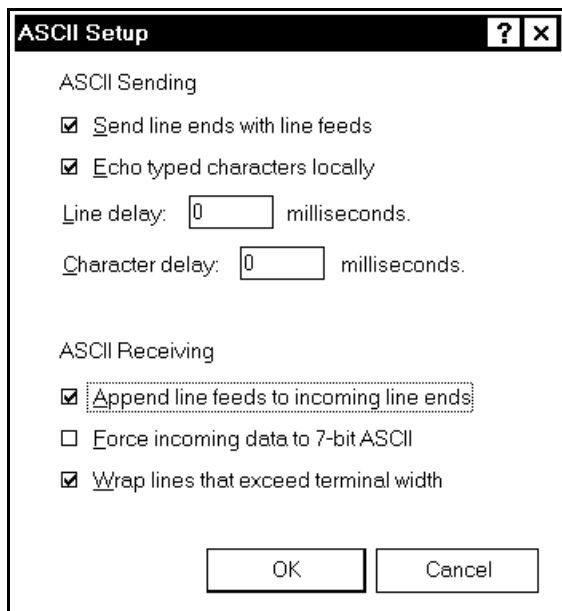
Select the same settings as above.

Next click the "Terminal Setup" button, and you will see the window on the next page.....



Make the settings the same as above, and then click "OK"

Next click the "Ascii Setup" button and you will see the window on the following page.....



The line delay and the character delay are important on this page . In the example above you will notice that the value is set to (0) on each setting. This works very well when the data you are working with is an EIA/ISO G-code program, which speeds up the data transfer, but for a Mazatrol program they should both be set to (1).

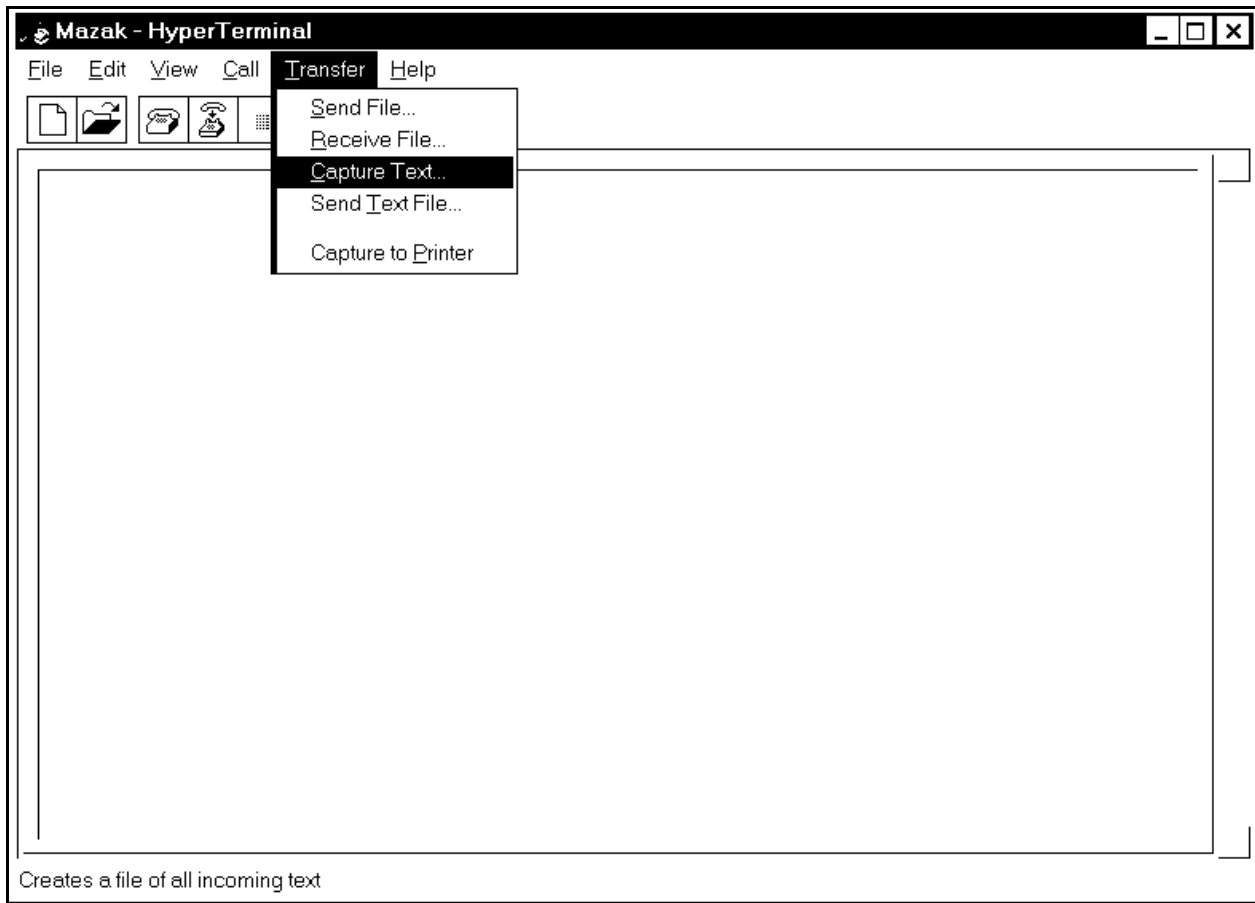
Set the page to the same values as above and click "OK"

Click "OK" once more on the properties window and you are set to go.

The next step is to save this setup.

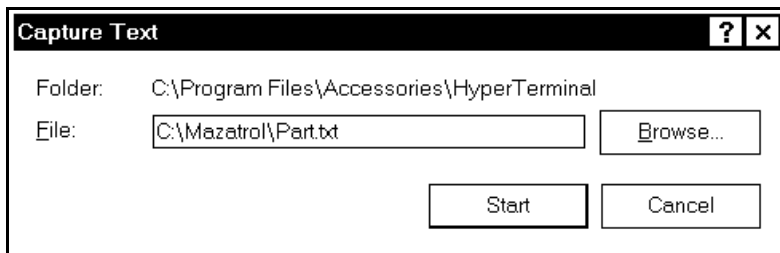
Go to the "File" selection on the menu and then "Save". Each time you use Hyper Terminal with the icon that you have selected for your Mazak Machine, these settings will automatically load.

Sending or Capturing a Text File



Capture Text will receive a program being sent from the Machine. Send Text File will send the file to the Machine.

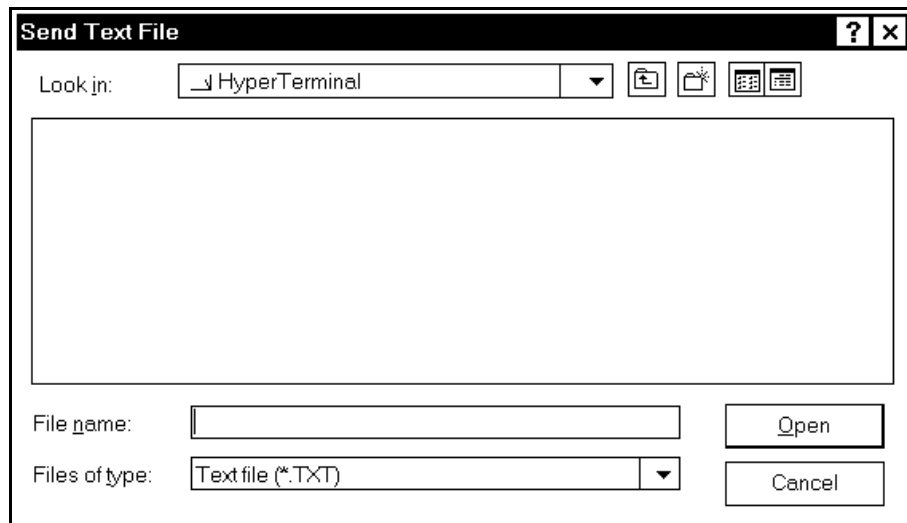
Select "Capture Text" and you will see the following window.



Type in a valid directory and filename for the program. Do not click "START" until you are ready to start receiving the file. Start the computer, then the machine

Sending a Text File

To send a text file click on "Transfer" and then "Send Text File" and you will see the following window.....

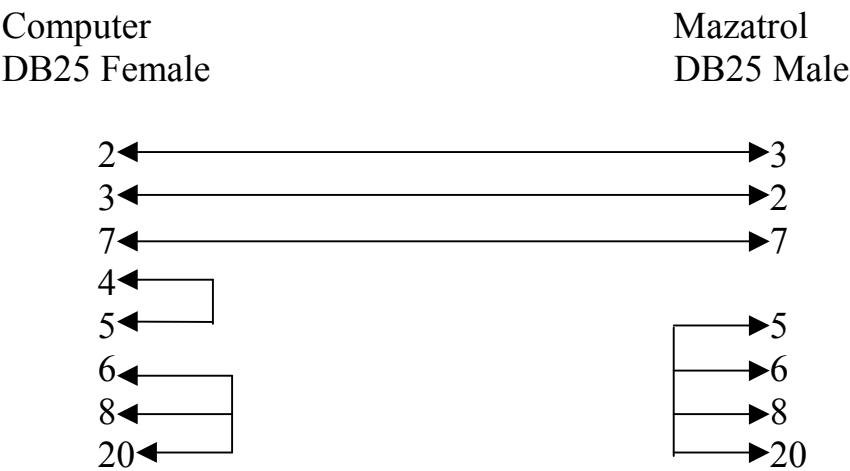


When sending to the machine, type the name of the file to be sent in the box. Do not select "Open". Go to the machine and select load first, and within a few seconds click the "Open" button.

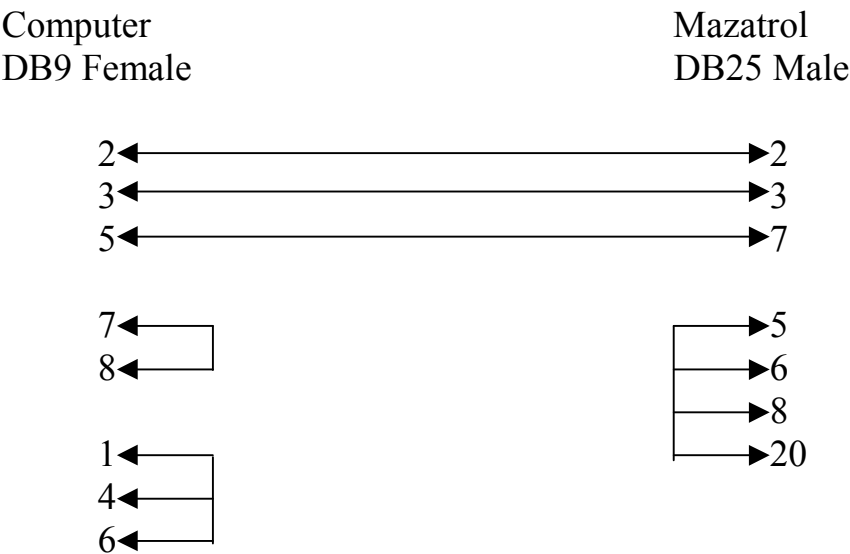
Cable Configurations

The proper cable configuration is needed to communicate with the machine through Windows. Most problems with communications arise from the wrong cable, or incorrect parameter settings.

Communication Cable for 25pin to 25pin RS232



Communication Cable for 9pin to 25pin RS232



Fusion640 Setup

How to get to detailed RS232 Parameters:

Press **Data I/O**

Press **Tape**

Press **Param**

Press **Param**

Detail

Set the "TAP" Parameters as follows:

Tap1 = 1

Tap4 = 1

Tap5 = 1

Tap26 = 0000 0001

Tap28 = 0011 1010

Tap29 = 50

Tap30 = 10

Tap31 = 0

The rest of the "TAP" Parameters are Zero.

On the initial PARAM. Display, Set baud rate, data bits **(8)**, Parity**(None)**, StopBit**(2)**, Hand Shake**(Dc Control)**, Wait time**(10.5sec)**, Format**(ISO)**, Same Wk.No**(Alarm)**, Port**(Com1)**



Mplus Com Parameters

Parameter	CMT	Tape	Description
G1	2	2	BAUD RATE
G2	3	3	STOP BITS
G3	0	1	PARITY TYPE
G4	0	0	PARITY CHECK
G5	3	3	DATA BITS
G6	1	1	TERM TYPE
G7	0	0	TERM CODE1
G8	0	0	TERM CODE2
G9	0	1	CR LF
G10	3	3	HAND SHAKE
G11	1	1	DC CODE
G12	0	0	DC CODE
G13	3000	150	REPLY TIMER
G14-16	0	0	RESERVED

PARAM	VALUE		PARAM	VALUE
G17	00000000		G35	0
G18	0		G36	0
G19	0		G37	0
G20	0		G38	0
G21	0		G39	00000000
G22	0		G40	00000001
G23	0		G41	0
G24	0		G42	0
G25	0		G43	0
G26	0		G44	0
G27	0		G45	0
G28	0		G46	0
G29	0		G47	0
G30	0		G48	0
G31	00000000		G49	00000000
G32	0		G50	&45<E>
G33	0		G51	&4E<N>
G34	0		G52	&44<D>



Tplus Com Parameters

Parameter	CMT	TAPE	Description
I1	2	2	BAUD RATE
I2	0	3	STOP BITS
I3	0	0	PARITY TYPE
I4	0	0	TERM CHECK
I5	0	3	DATA BITS
I6	0	3	HAND SHAKE
I7	0	1	DC CODE
I8	0	10	WAIT TIMER

Parameter	Value
I9	0
I10	1
I11	1
I24	0
I49	&45(E)
I50	&4E(N)
I51	&44(d)



Communications With Windows95

Troubleshooting

The machine gives an alarm (Tape reader miss connected)

1. The cable is connected to the wrong port.
2. Check the cable pinout.
3. The cable length is too large or has some outside interference.

1. There is some problem in the cable. (Pins 2 & 3 are shorted?)

The machine give an alarm (Set New Paper Tape)

1. The timer is running out for reply wait time.
2. If the program is an EIA/ISO transfer, check the end of the program. The control looks for a (M02, M30, M99, and % to signal the end of the program.
3. Check the parameter for the EIA/ISO end of program code.

The machine gives an alarm (H Parity Alarm)

1. The cable is wired wrong.
2. The wrong end of the cable is connected to the machine.
3. The communications parameters are not set correctly.
4. The serial port on the computer is using a high-speed sync mode. (Disable FIFO buffers in the UART)
5. The cable has interference caused by high voltage noise. (Welder, Lights, Wiring)

"I can download a program to the computer, but can not send it back to the machine.

2. The control already has that program number registered. (Remove or renumber it)
3. The timer for reply wait time is running out on the machine before the computer is started.



M640_PrintKey_Instructions.doc

The following is quick explanation to use printkey.exe

This software will generate a hardcopy of screen and allow you to save to a file without having a keyboard to do PrintScrn.

This software is freeware and can be distributed freely as long as no money exchanges hands.



To use, execute the printkey.exe. This will place the printkey icon down by date on taskbar. If you wish to make a hardcopy of screen, simply click with left mouse button. To view what you just made hardcopy of either very quickly click twice on left mouse or (preferable) press the right mouse key and select Open. When select Open you will see the screen saved.

Click on the left floppy diskette to save to a file. Type in the filename and use either *.bmp or *.gif extension for saving. Bmp is best picture , but takes about 300 to 600k and vs about 7k to 14k for gif. So, you can put more Gif pictures on a diskette.

Note1: If you have a keyboard and press the PrintScrn key, the printkey software comes up.

Note2: You can use this software on your desktop pc if has Win95. Don't know about WinNT or Win98. This is useful for viewing saved files and printing and also for saving to clipboard to use in Word documents.

Note3: You can edit the area and save to clipboard using this software's tools.

Note4: If you click on right mouse and select Open, then the screen print will not show the Window's taskbar. Allowing you to show full Mazatrol menu keys.

M640_Printer_Information.doc

It is not possible to use the PRT02B or PRT02A printers that we have been using on the M640 control. There is no Window's printer driver for them.

We can only use Window 95 supported printers and you will need to use a serial to parallel converter.

The alternative is to add a PCMCIA ethernet card to the control and connect to a LAN system and use a networked printer. This is probably the best way and how we have connected to our lab.

We recently found that when connecting an HP Laserjet 5 which had a serial interface, it would print well on any screen but the program screen.

This was because the correct printer driver wasn't installed. The Window's 95 driver called up 5MP and would get a bunch of lines. Installed one that came with printer for 5/5M (HPPCL5G.Drv) and worked perfectly. The serial cable was a null-modem cable purchased from Best Buy.

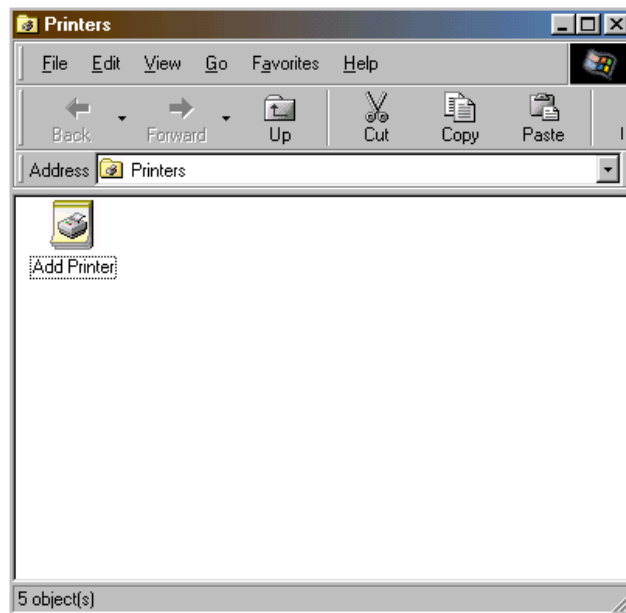
I had same situation with an HP Laserjet 6 that was corrected when loaded the drivers which came with printer.

Another printer that our Champion Application got to work is the Panasonic KX-1520 and they use the Epson LQ 1000 printer driver.

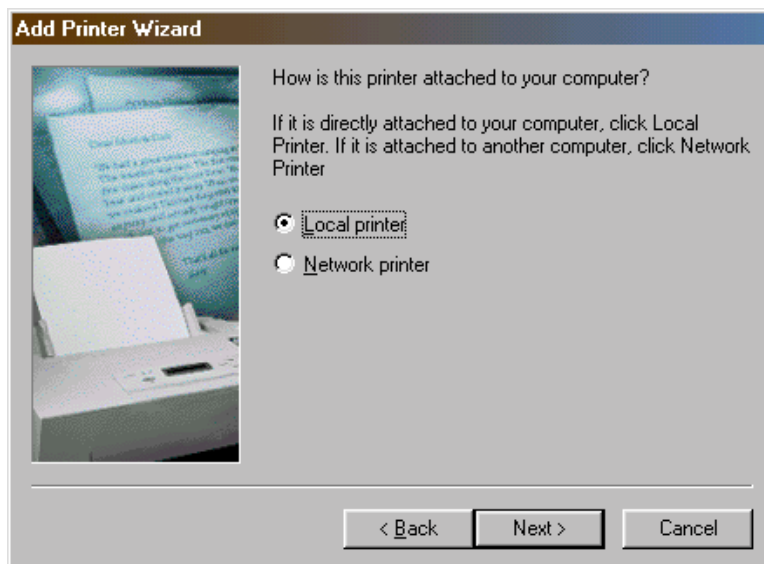
Setting Up Fusion 640 to Print to a Program to a Text File

M640 Printer Setup Print To File.doc

1. Move the cursor to the bottom left corner on the screen, left click once. The Start button should appear. Click the start button, go to settings, then click on Printers.
2. Double Click Add Printer.

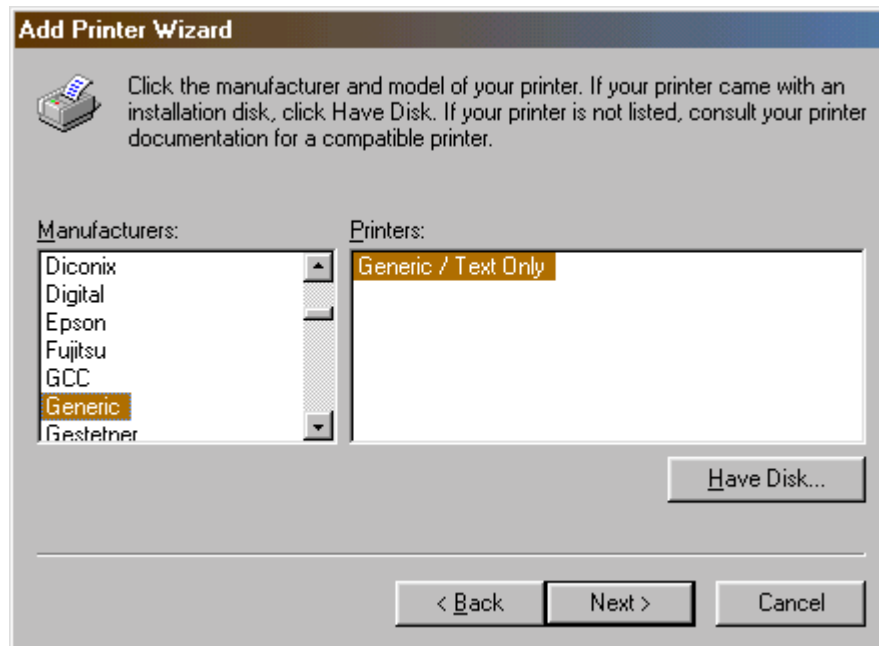


3. Click Next.
4. Select Local printer. Click Next.

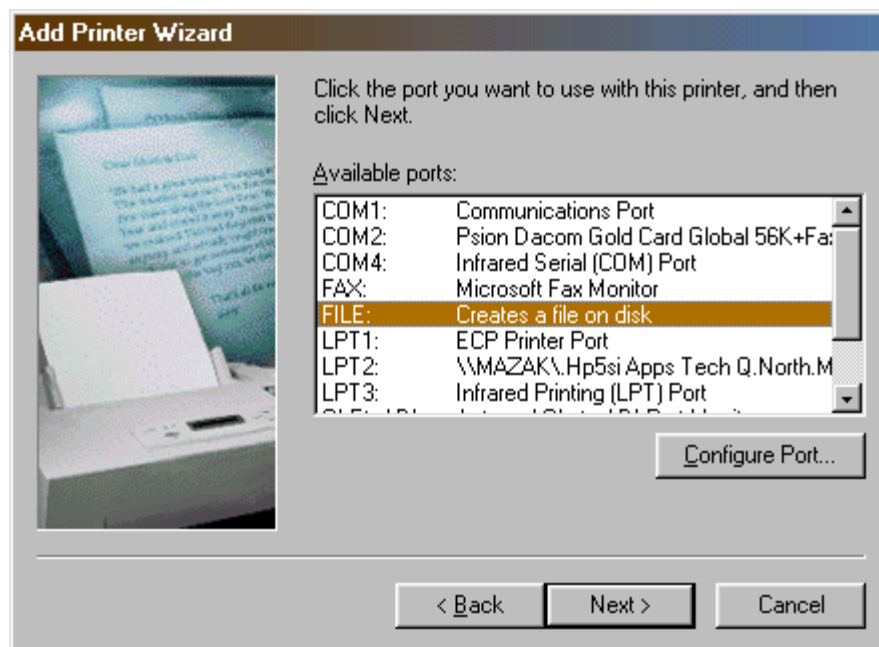


5. Select Generic from the printer Manufacturers List. Click next.

Setting Up Fusion 640 to Print to a Program to a Text File

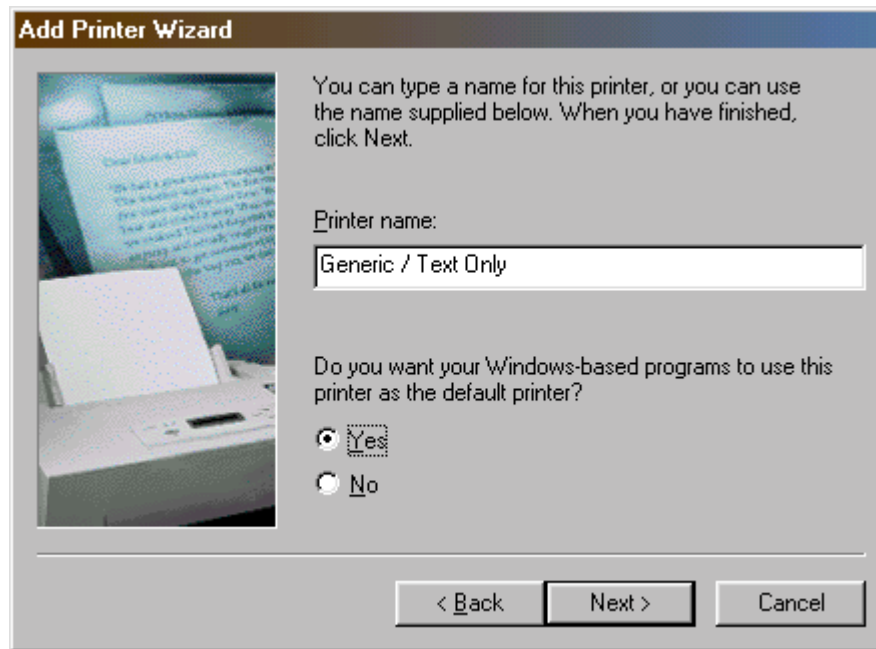


6. Select **FILE: Creates a file on Disk**. Click Next.

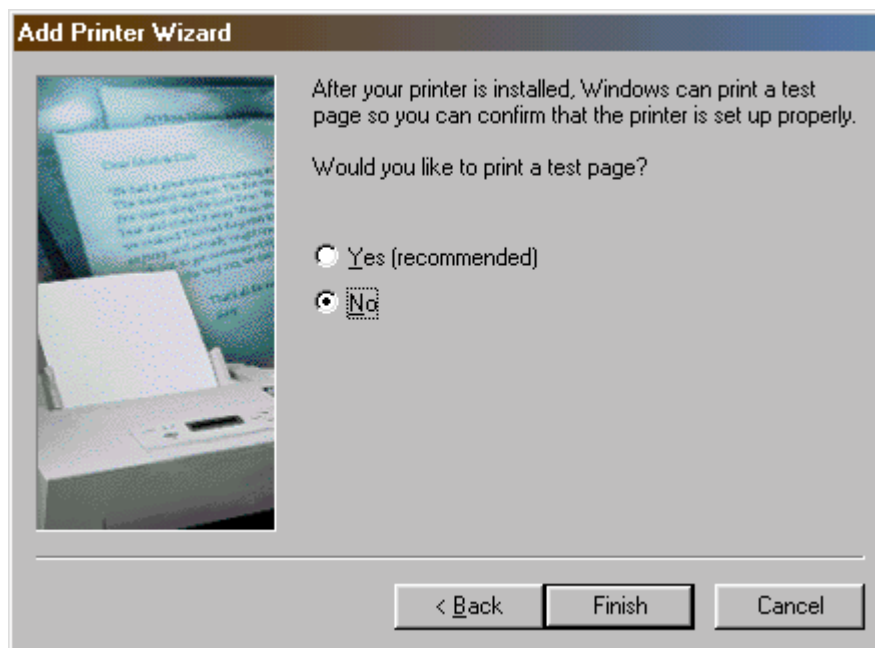


7. Check Yes. Click Next.

Setting Up Fusion 640 to Print to a Program to a Text File

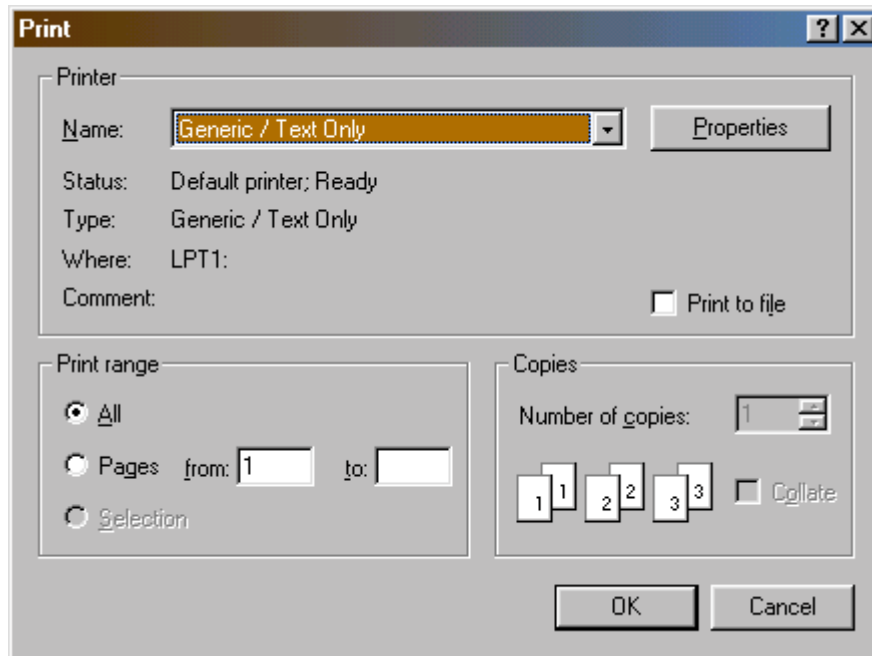


8. Check No. Click Finish.

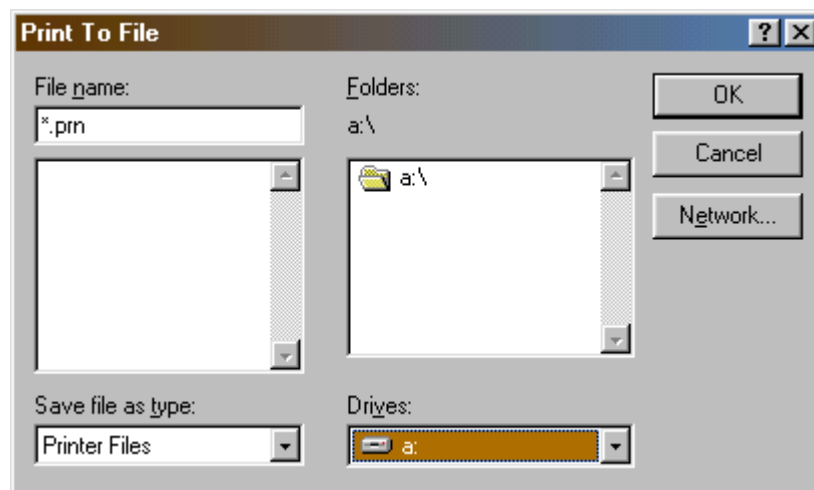


Setting Up Fusion 640 to Print to a Program to a Text File

9. Wait while the drivers load .
10. Test the printer driver by going to a program and selecting print from the File menu.

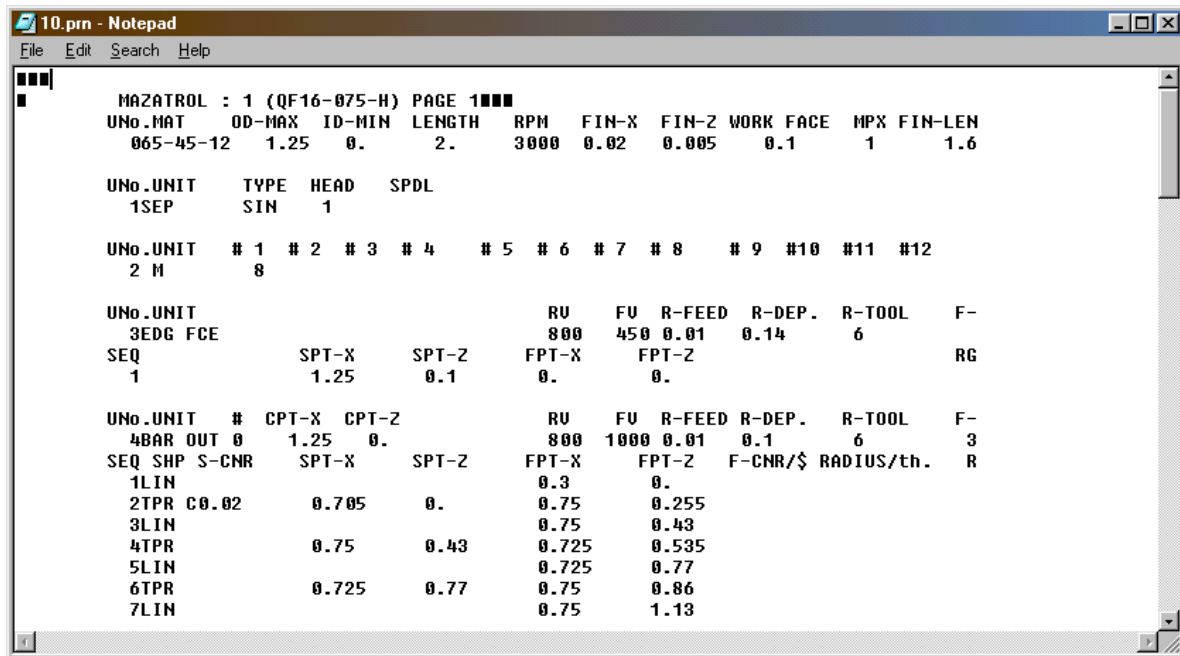


11. Click OK. Type the Name of the file you want to save the print as and select the location where you want the file to be saved.



Setting Up Fusion 640 to Print to a Program to a Text File

12. Using Note Pad, Open the file you saved.



```
10.prn - Notepad
File Edit Search Help

MAZATROL : 1 (QF16-075-H) PAGE 1
UNO.MAT OD-MAX ID-MIN LENGTH RPM FIN-X FIN-Z WORK FACE MPX FIN-LEN
065-45-12 1.25 0. 2. 3000 0.02 0.005 0.1 1 1.6

UNO.UNIT TYPE HEAD SPDL
1SEP SIN 1

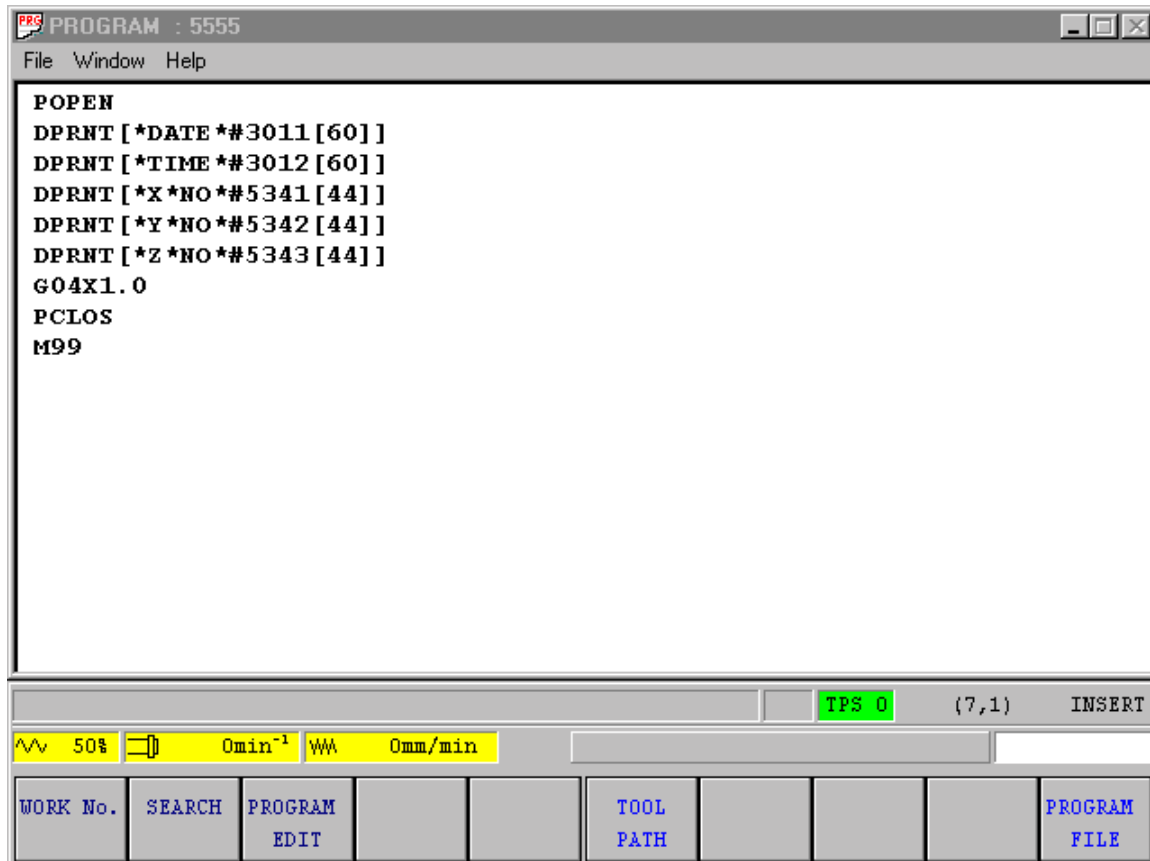
UNO.UNIT # 1 # 2 # 3 # 4 # 5 # 6 # 7 # 8 # 9 #10 #11 #12
2 M 8

UNO.UNIT # CPT-X CPT-Z RU FU R-FEED R-DEP. R-T00L F-
3EDG FCE 800 450 0.01 0.14 6 F-
SEQ SPT-X SPT-Z FPT-X FPT-Z RG
1 1.25 0.1 0. 0.

UNO.UNIT # CPT-X CPT-Z RU FU R-FEED R-DEP. R-T00L F-
4BAR OUT 0 1.25 0. 800 1000 0.01 0.1 6 3
SEQ SHP S-CNR SPT-X SPT-Z FPT-X FPT-Z F-CNR/$ RADIUS/th. R
1LIN 0.3 0.
2TPR C0.02 0.705 0. 0.75 0.255
3LIN 0.75 0.43 0.75 0.43
4TPR 0.75 0.43 0.725 0.535
5LIN 0.725 0.77 0.725 0.77
6TPR 0.725 0.77 0.75 0.86
7LIN 0.75 1.13
```

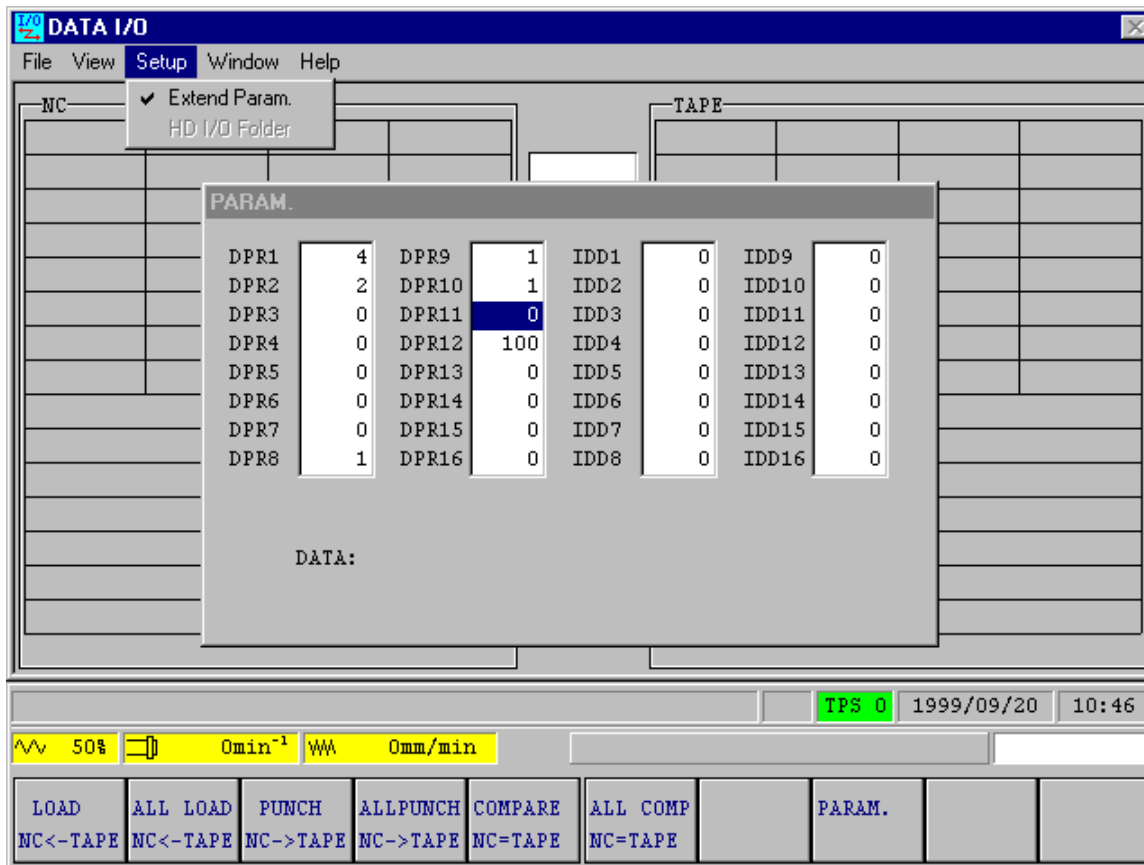
M640_Macro_Print.doc

Below screens show program example and parameter settings for the CNC and tested connected to a computer running Xtalk.



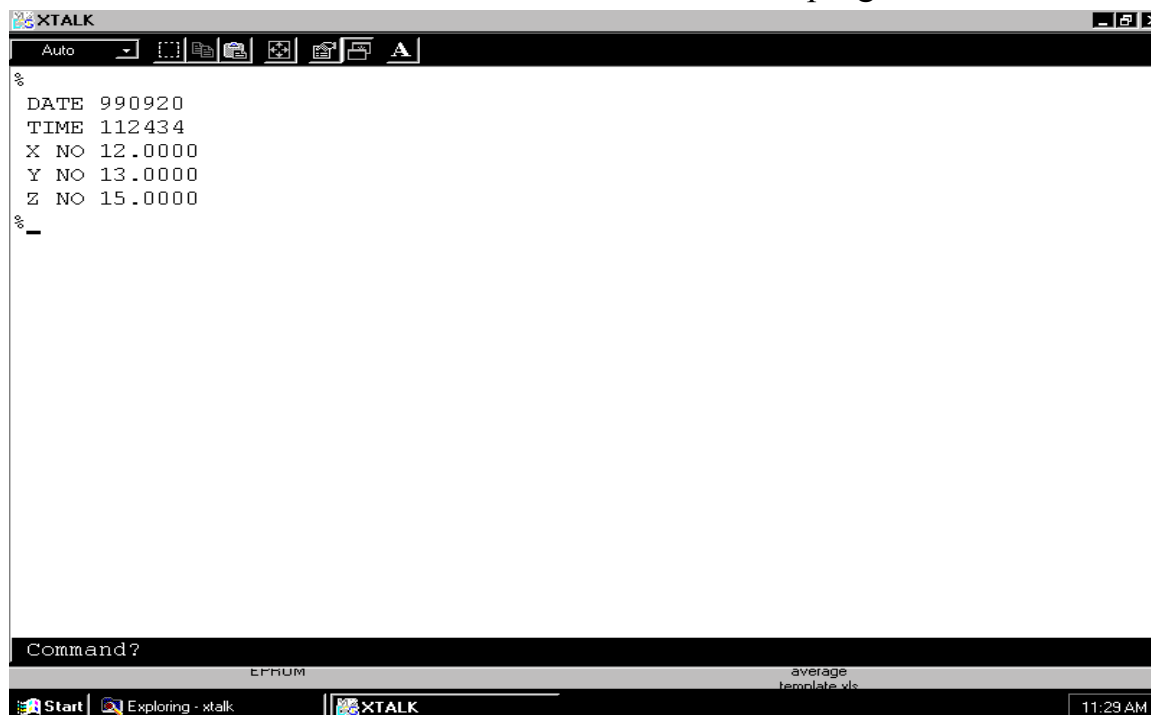
Above shows a sample macro program. Set the other computer communication parameters to 4800 baud, 2 stop bits, and even parity. Used software handshaking, too.

When print out to terminal screen, shows Time/Date and Wpc data. The communication parameters need to be set as shown below on the CNC. Set DPN parameters as shown. The internal Rs232 cable needs to be connected to CF22.(The leftmost Rs232 plug on operator pc board).



To access the DPR parameters, select Data I/O screen and select the Setup on top and then the EXTEND parameters.

Below shows what the actual data looked like from program 5555.

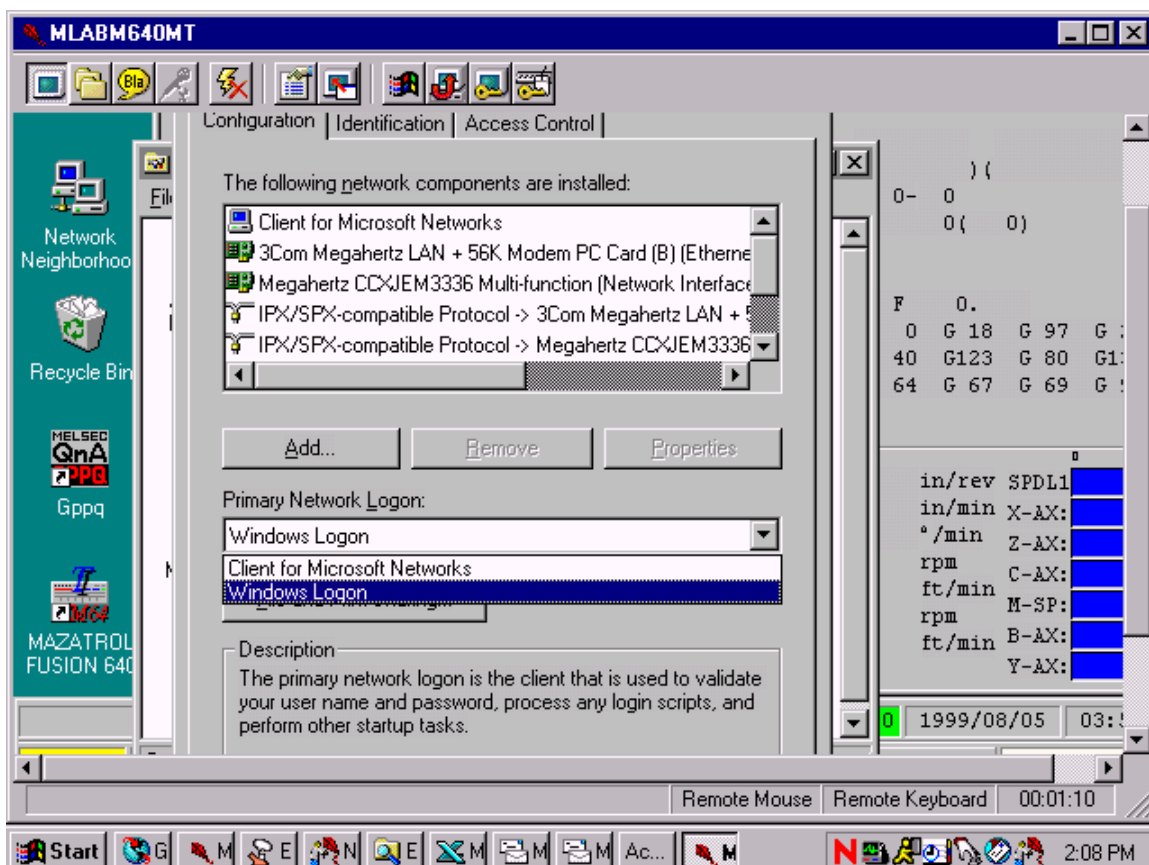


M640 Ethernet Network Logon Bypass.doc

If you add an ethernet card and connect to a network, the control will automatically ask you for a password every time power on. This can become a nuisance and prevent machine from going into auto-power on and running a warm-up program.

It is possible to bypass this if you change the network setting to select “Windows logon” as shown below

Next, go to Explorer and do a “Find files” to locate all files with the extension *.pwl These are the currently used password files and if these are deleted Windows will ask you again for a username and password when you restart the control. At that point you have to enter a username but do not even tab to the password block, just click on OK and it will not ask for a password again..



When you add a card, it will assign Client for Microsoft Networks as your primary logon. Change to say Window Logon and save.

M640 Ethernet Card Instruction

Note: The following was supplied from M640 project team and is good write up on installing an Ethernet card to the M640 control. However, please be aware that you should follow the instructions supplied with the ethernet card. Also, some networks may use IPX/SPX protocol instead of TCP/IP. And take special care when assigning the number for TCP/IP.

Technology explanation data

The introduction method of the network

The Outline

Necessary Devices

The Connection of the Devices

The Setting of Software

The Sharing Method of Data

1.The Outline

We do such technical explanation that connects M640 to factory inside or inside a company premises network.

You come to be able to forward machining program files, control of the “RUNNING CONTROL” data on M640 and so on by connecting M640 to the network.

Also, even to receive the network service of our company, when a modem is connected to the personal computer of the office that was connected the network becomes possible.

On this sheet, we explain about the Ethernet 10BASE-T that is the most general network connection method.

If the network that you use is an Ethernet method, the outline is same almost. But only 10BASE-T is being supported, in the network devices that our company recommends for M640.

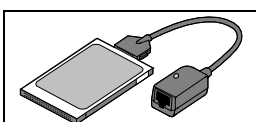
2.Necessary Devices (In the case of 10BASE-T)

[The devices needed for M640 side]

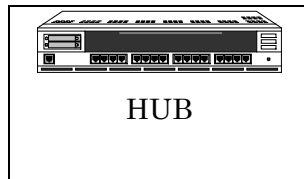
Device name	Outline
PC card type Ethernet network card	It is the outside devices that offer the connection function of the network to M640. It connects by using PC card I/F to M640.
HUB	It is such outside devices that connect the network card that connected to M640 to the your company network. You do not need to purchase it newly, if there is the connection port of a vacancy in the hub in use.
Twist pair Ethernet cable	It is such cable that connects the network card connected to M640 to the hub.

[The devices needed for the personal computer side that is connected the network]

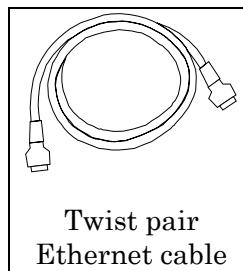
Device name	Outline
Ethernet network card	It is the inside devices that offer the connection function of the network to your PC. Please prepare Ethernet network card that supports 10BASE-T that fit to your PC.
Twist pair Ethernet cable	It is such cable that connects the network card connected to your PC to the hub.



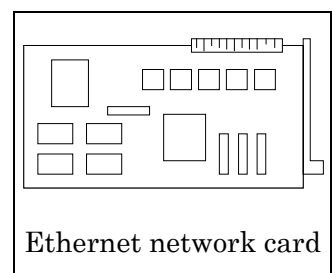
PC card type
Ethernet network
card



HUB



Twist pair
Ethernet cable



Ethernet network card

3.The Connection of the Devices

[The connection procedure on the side of M640]

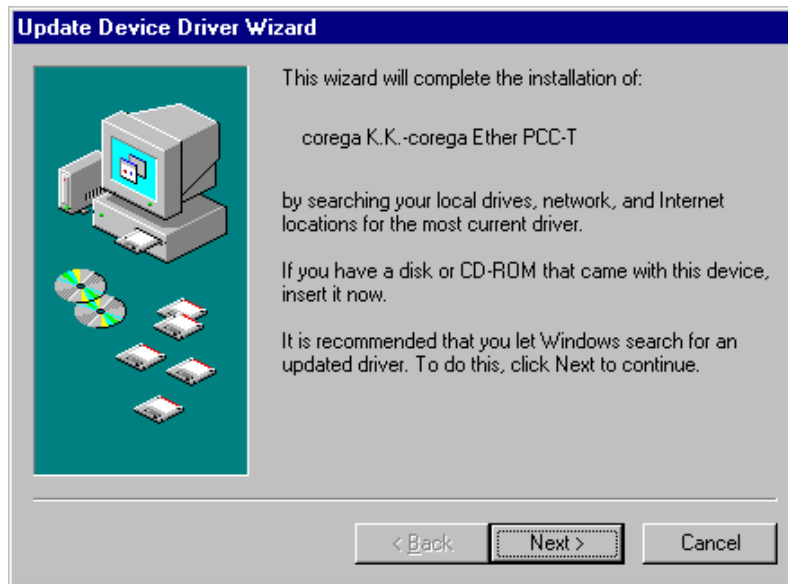
(We explain it about EtherLink III made of the 3Com company that our company is recommending)

[1]Preparation of connection

- 1.Stop auto running operation and so on.
- 2.Change running mode to Zero return mode and the screen to POSITION display.

[2]Connect Ethernet network card

1. Please insert Ethernet network card into the optional slot in the PC card interface with 2 slots.
2. When do for a while, the Hardware Wizard of Windows95 is triggered automatically and the dialogue of the rough sketch is displayed.



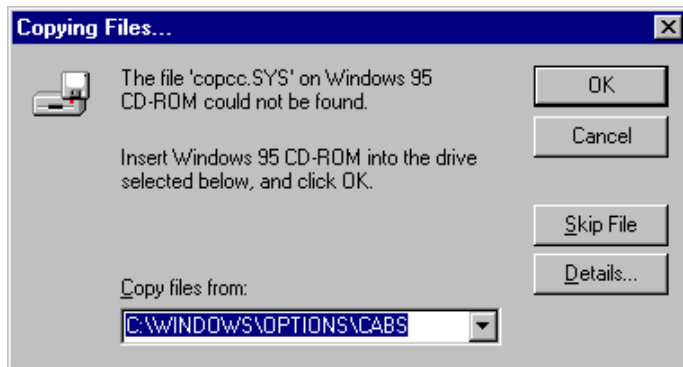
[3]Install device driver

1. Insert the device driver disk that is belonging to Ethernet network card into the floppy-disk drive of M640.
2. Click the “Next” button on above dialogue with mouse left button.
3. The installation of the device driver begins. When do for a while, the following dialogue is displayed.

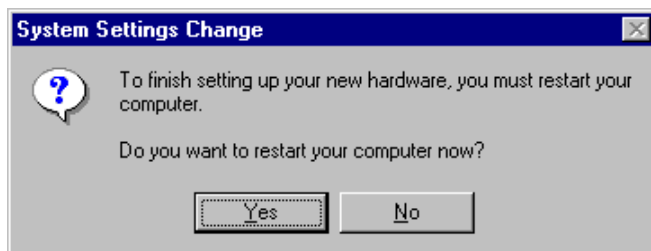


4. Click the “Next” button on above dialogue with mouse left button.

5. The installation of the device driver is continued. When do for a while, the following dialogue is displayed.



6. Input "A:\\" to "File of copy source" of above dialogue. And then, click "OK" button with mouse left button.
7. The installation of the device driver is continued. When do for a while, the following dialogue will be displayed.

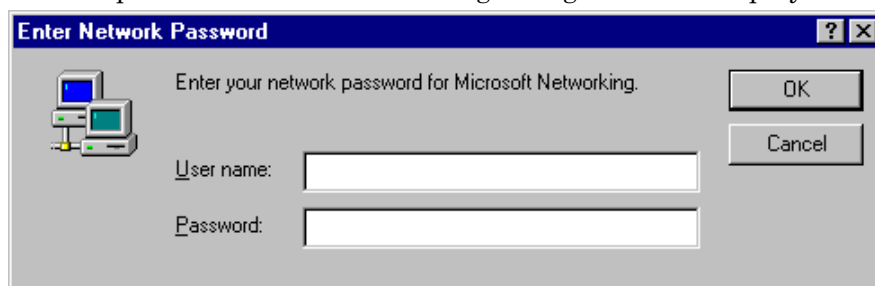


8. Click "No" button on above dialogue with mouse left button for cancel to reboot Windows.
9. Power off and power on the M640.

4.The Setting of Software

[1]Power on after installation network

- 1.When power on M640 the following dialogue will be displayed after installed network.



- 2.When your click "OK" button with mouse left button, without inputting in a password anything and input an optional user name, the triggering processing is continued. Normally, this dialogue is appeared each time when you power on. But you can also set up it so that you activate it without displaying this dialogue. If you want to set so, please see the following "[4] Change setting "Enter Network Password" dialogue to be not appeared when power on".

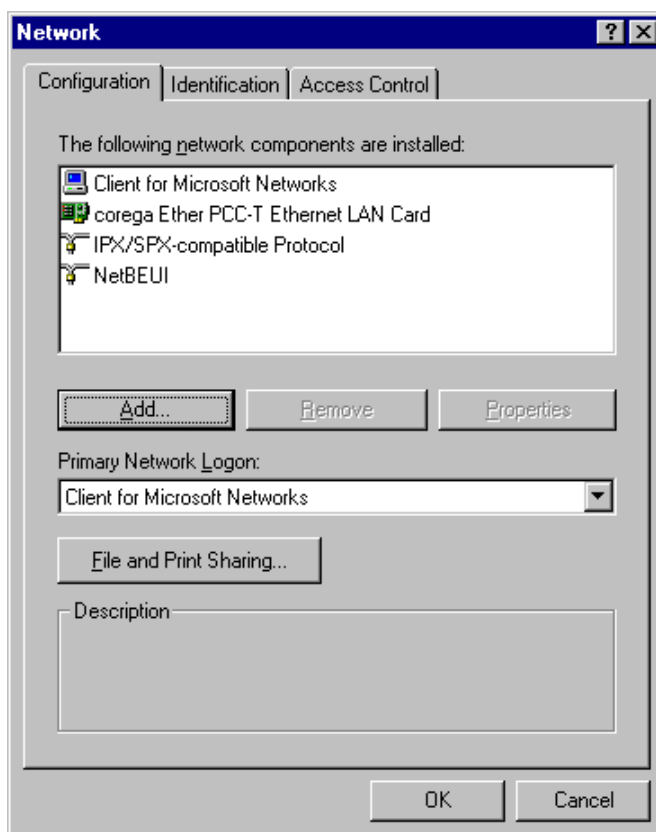
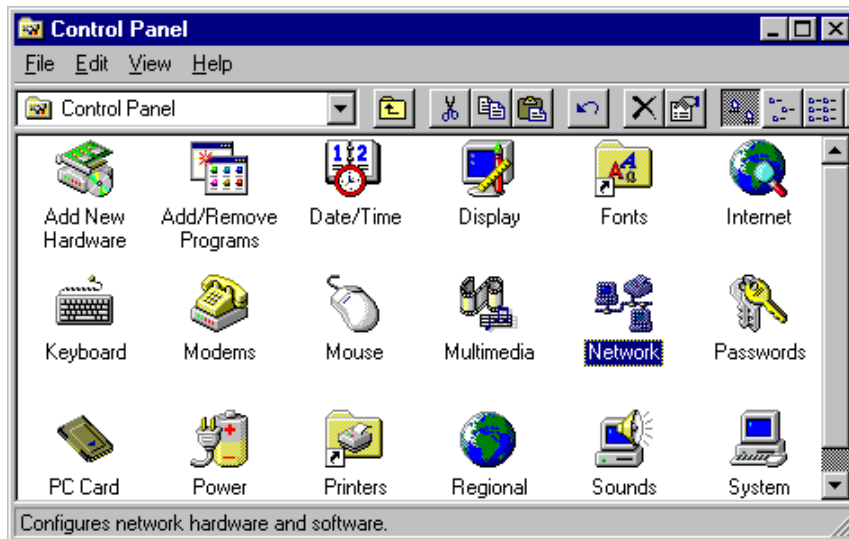
[2]The setting of user information

1. Display the "Network" dialogue with the following procedure, after wait until POSITION display is appeared with power on M640. Please do not push "OK" button on the "Network" dialogue, until also, all the setting end below.

[A] Clicking the "start" button by the mouse left button. The start menu is displayed.

[B] Selecting "control panel" from the item of "Settings". The window of "Control Panel" causes to be displayed.

[C] Double-click the icon of "Network" in the window of "control panel" with mouse left button.



2. Click "Identification" tab with mouse left button and cause to display it.

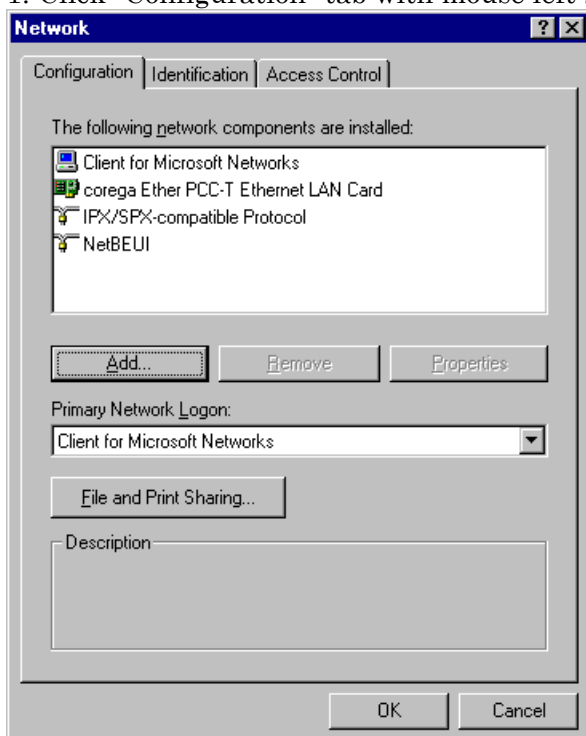


2. Input the work group name and the computer name and then, push “OK” button. The computer name becomes the name that network is distinguished. These names are an optional thing and be good. However, the work group name shall be the same name as the personal computers of in addition to that being connected to the network. (Ask the name that sets up it to the one, in the case that the network manager is been.)

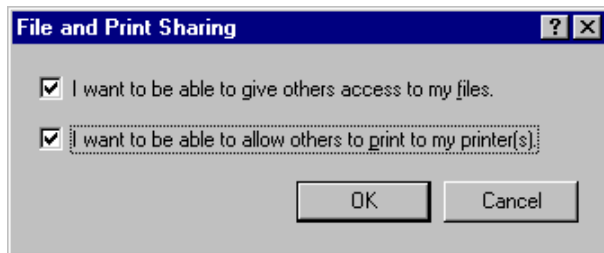
[3] Change the setting to be able to share data and printer

If you want to transfer program files with the other PC on the network or use printers connected to M640 from the other PC on the network, you have to do the following.

1. Click “Configuration” tab with mouse left button and cause to display it.



2. Click “File and Print Sharing...” button with mouse left button, the sharing dialogue of the “Files and Print Sharing” cause to be displayed.



3. Attach a check mark to “I want to be able to give others access to my files.”, in the case that you want share the file of program etc with other personal computers.

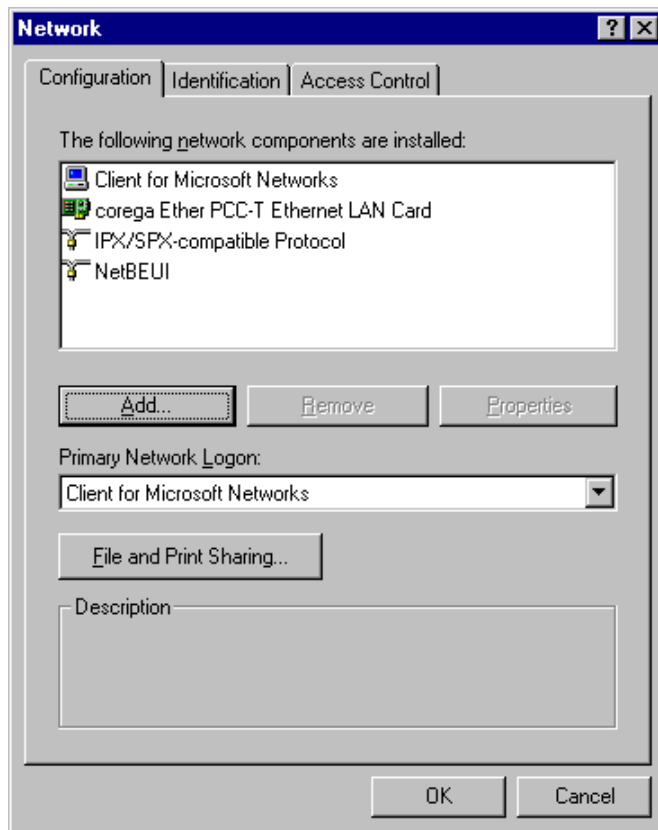
4. Attach a check mark to “I want to be able to allow others to print to my printer(s).”, in case that you want use printers connected to M640 form other personal computers.

5. Close this dialogue by pushing “OK” button with mouse left button. When the sharing becomes effective “File and Printer sharing for Microsoft Networks” is added to “The following network components are installed” of setting dialogue of the network.

[4] Change setting “Enter Network Password” dialogue to be not appeared when power on

If you do the following setting you can power on M640 without causing to display “Enter Network Password” dialogue that usually, is displayed when power on.

1. Click “Configuration” tab with mouse left button.



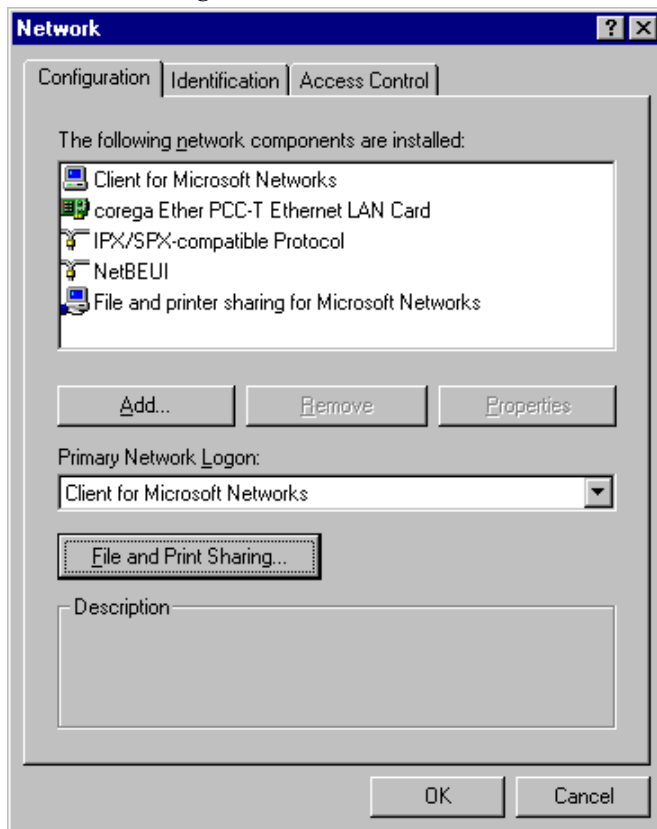
2. Change “Primary Network Logon” to “Windows Logon” from “Client for Microsoft Networks”.

[5]The installation of TCP/IP protocol.

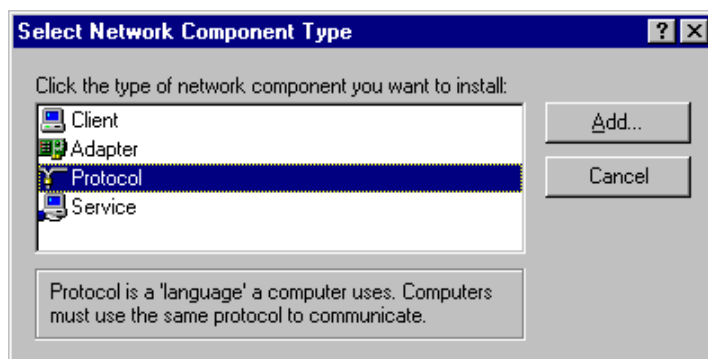
If you do only want do control of the “RUNNING CONTROL” data, translate program etc, you do not need to install TCP/IP protocol.

If your PC connected to network in your office has a modem, you can accept our company’s network services by installing TCP/IP protocol.

1. Click “Configuration” tab with mouse left button and cause to display it.

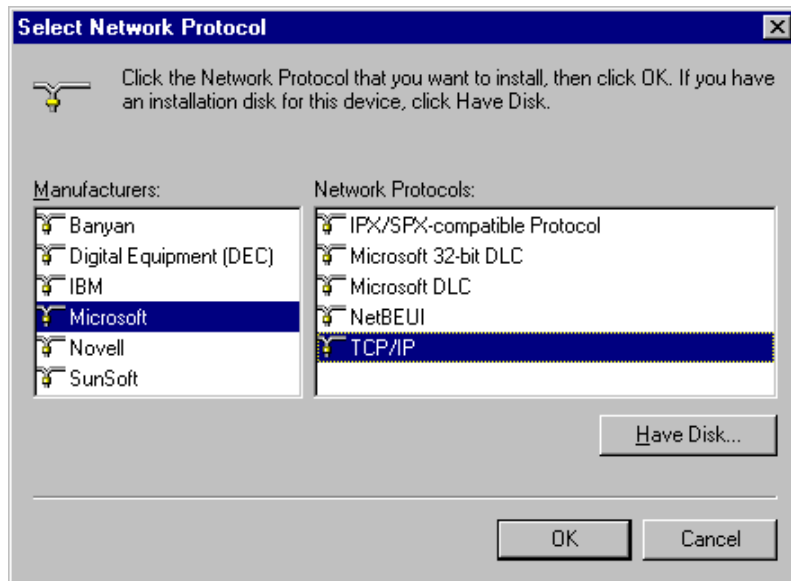


2. Click “Add...” button with mouse left button and cause to display “Select Network Component Type” dialogue.

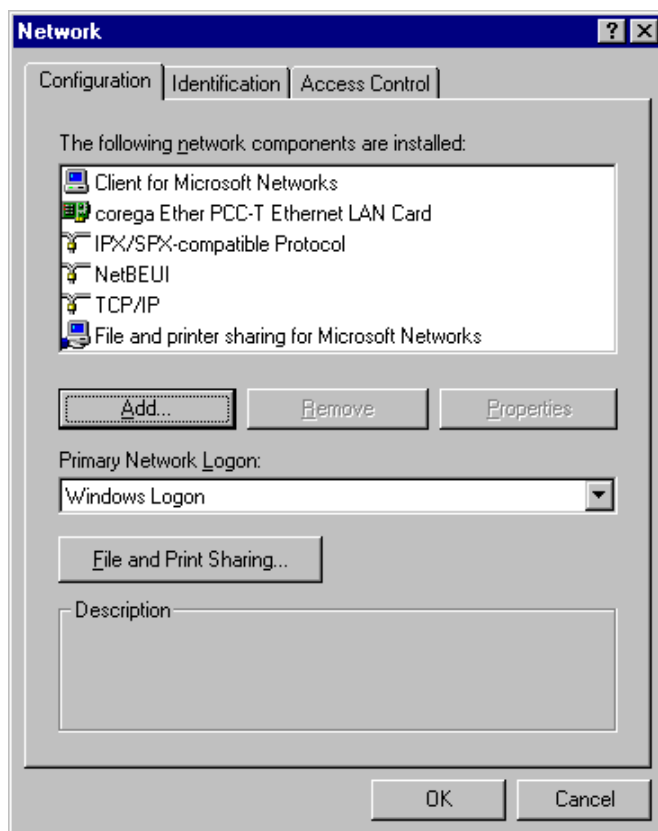


3. Click “Protocol” in “Select Network Component Type” dialogue and push “Add...” button.

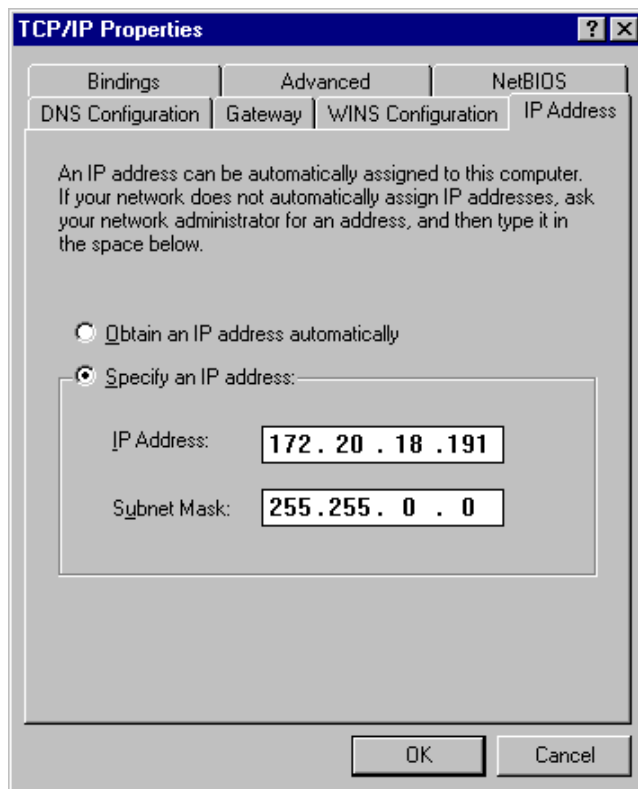
4. Click “Microsoft” that is in the look of “Manufacturers” with mouse left button. And then, click “TCP/IP” that is in the look of “Network Protocols” with mouse left button.



5. Install TCP/IP protocol by pushing “OK” button. When the installation completes the TCP/IP protocol is added to “The following network components are installed” of “Configuration” tab.



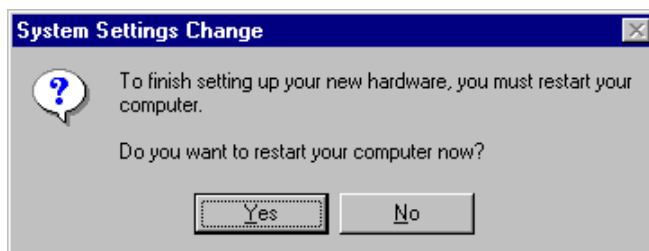
6. Click “TCP/IP” that is in the look of “The following network components are installed”. And then, push “Properties” button with mouse left button and cause to display “TCP/IP Properties” dialogue.



7. Set up unique IP address peculiar to M640 that you are using now. You must set up the address that differs with the addresses of all the M640 and also personal computer that connected to the network. Also, you must set up something except for IP address in the case that your network is done special setting. Please ask it to the network manager regarding these setting contents.
8. If all the value is set up, Click “OK” button with mouse left button for close “TCP/IP Properties” dialogue.

[6] Complete the setting of “Network” dialogue.

- 1.If you finished the setting of the items from [2], click “OK” button with mouse left button.
- 2.The software regarding the items that have set up is installed. And then, the following dialogue is displayed when the installation is completed.



- 3.Click “Cancel” button with mouse left button. Because you have to cancel to rebooting Windows95.
- 4.Power off and power on M640.

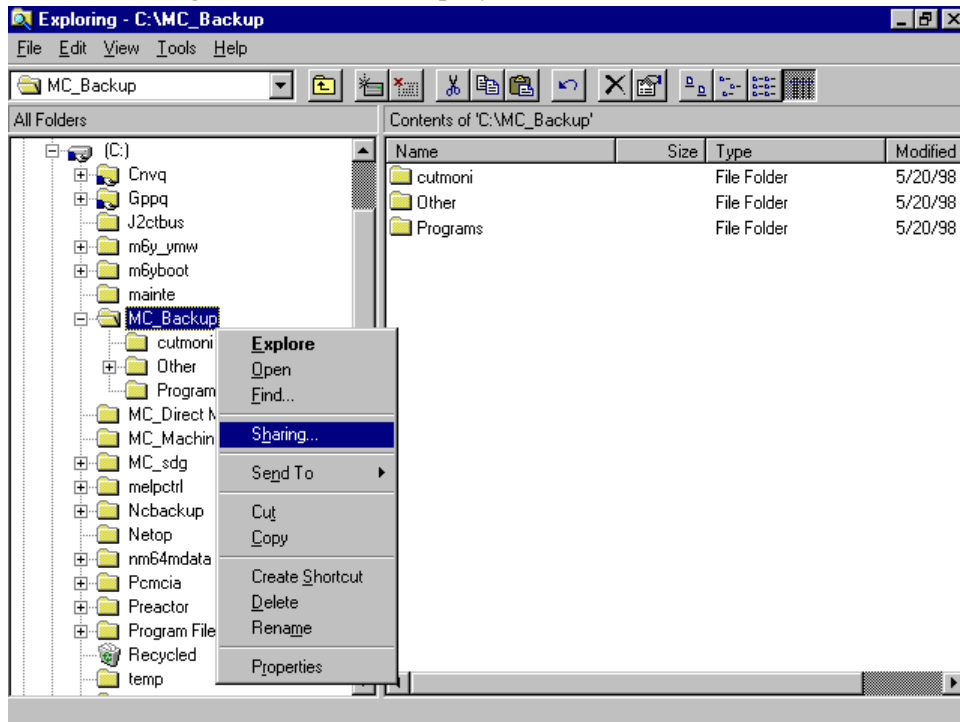
5.The Sharing Method of Data

For example as the sharing method of data, forwarding of programs from PC connected to network to M640.

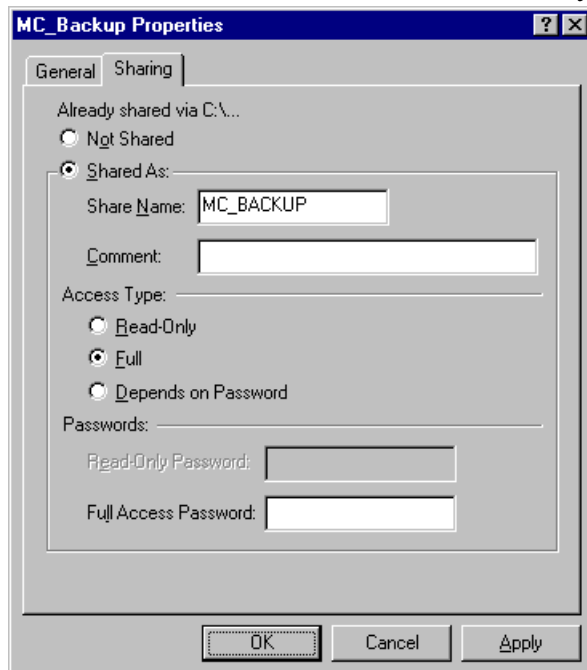
We explain the forwarding programs from PC connected to network to M640.

[1] Change the Backup folder of M640 to a sharing folder

1. Trigger Explorer and click the Backup folder with mouse right button.
2. Click “Sharing...” item in the displayed menu with mouse left button.

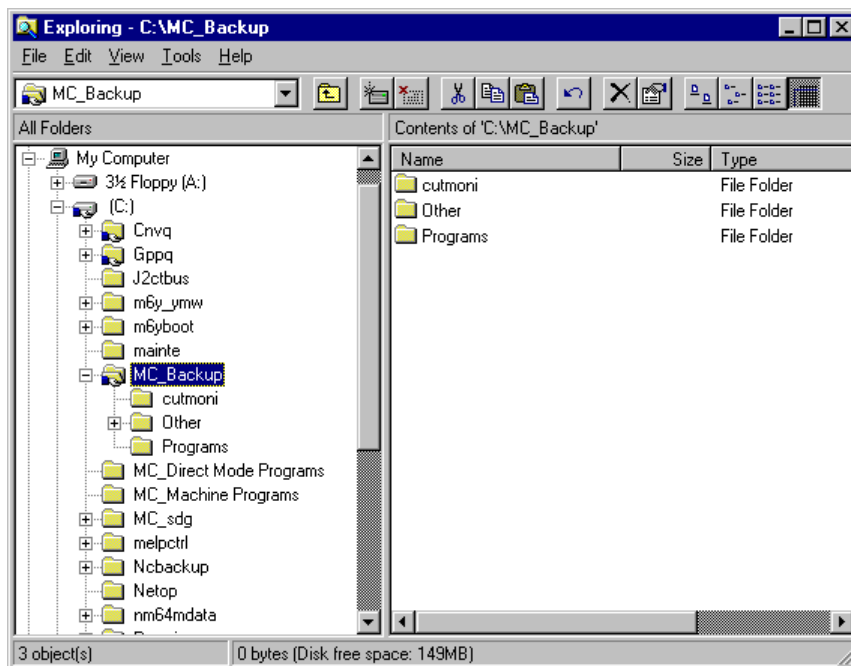


3. Click “Shared As” radio button in the displayed dialogue with mouse left button.
4. Click “Full” radio button listed in “Access Type” with mouse left button.



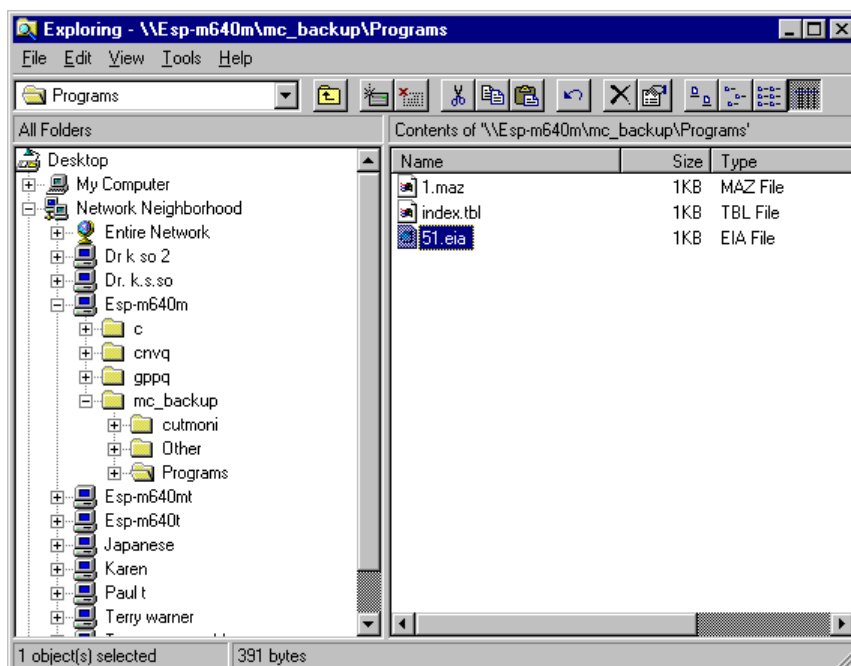
5. Push “OK” button.

6. Confirm that the Backup folder is turned sharing on Explorer. If the Backup folder is shared, you can see the mark of the hand is added to the icon of the Backup folder.



[2] Refer the shared Backup folder of M640 with your PC connected to network

1. Trigger Explorer on the side of your PC connected to network. And then, confirm that there is M640 in the list of PC on the network.
2. Confirm that there is the Backup folder that is shared with the process [1] under M640 icon.



[3] Forward programs to the Backup folder that is shared to the network of M640 from PC

- 1.Trigger two Explorer windows on your PC.
- 2.Open the Backup folder of M640 on the network with one of Explorer.
- 3.Double-clicking the “Programs” folder that is in the Backup folder with mouse left button to open it.
- 4.Open the folder that includes the forwarding program with Explorer of the other side.

Click and hold the forwarding program with mouse left button. And then drug & drop it to the other window that displayed “Programs” holder on M640 and that opened by the other Explorer.

[4] Move or copy the forwarding program to NC memory

- 1.Display “PROGRAM FILE” display on M640.
 - Move or copy the forwarding program to NC memory by using the program transfer function of “PROGRAM FILE” display. Please refer to “6-6 PROGRAM FILE Display” of OPERATING MANUAL for M640.

To: Regional Offices

Date: 11/24/1999

From: Michael Dault

RE: Software Update from the Service Directory.

For Multiplex ,Dual Turn, IGX-200SY machines:

Main-A BND-369W000-B3. , programmed on HR401 card

Main-B BND-369W001-B3 , on 6 diskettes, download from
the service directory under
Mazm640\mainsw\lathe\B3

For any other lathe, such as QT, SQT, IGX , including

IGX-200Y(Not SY) machines whether they are MT or T type control.

Main-A BND-365W000-B3a. , programmed on HR401 card

Main-B BND-369W001-B3a , on 6 diskettes, download from
the service directory under
Mazm640\mainsw\lathe\B3

For all machining centers:

Main-A BND-360W000-C0, programmed on HR401 card

Main-B BND-360W001-C0 , on 6 diskettes, download from
the service directory under
Mazm640\mainsw\mill\C0

The plc ladders can be found under the following:

Mazm640\m640ladd\ky

and look under model no. of directory.

(Note: 439KA*** & 439KB*** are different VTC machines)

Mazm640\m640ladd\japan

and look under the mfg. plant and the model no. of directory.

M640 Service Drive Directory.doc

Below shows the Service Drive Information under MazM640.

Document -- All M640 Document procedures.

M640ladd -- All M640 Ladders that I have. Broken into 3 main sources.

1) Japan

A) Minokamo

B) Oguchi

C) Seiko

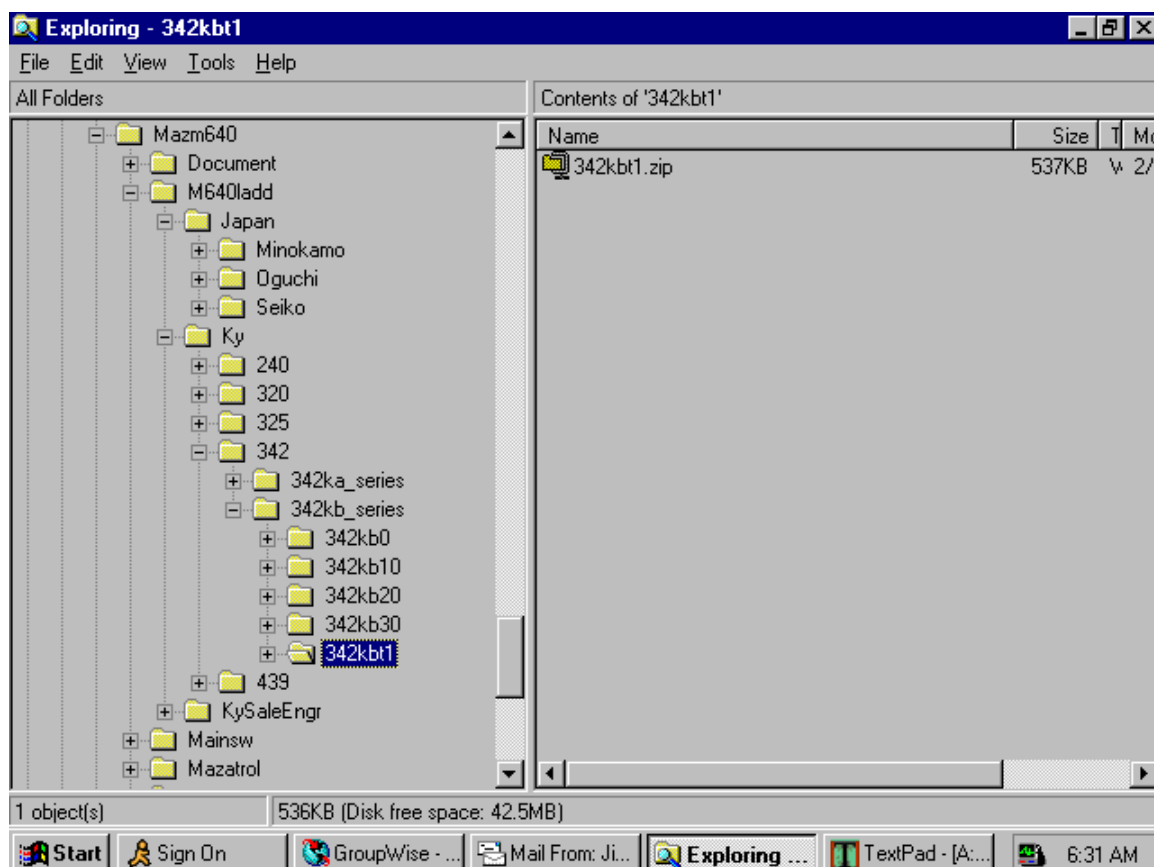
2) Ky

These are from Ky. Production.

3) KySaleEngr

These are from Ky. Sales Engr.

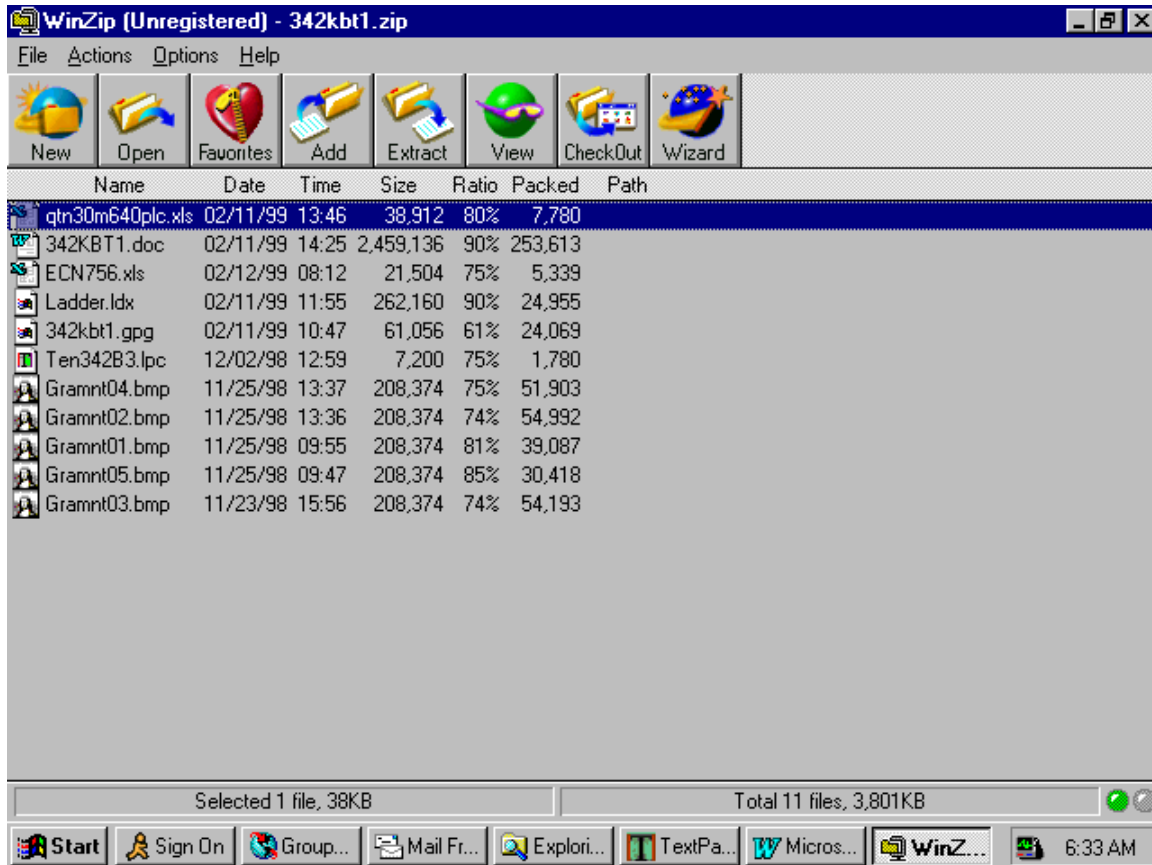
Filed by Model Code and then version info.



Below show files within the 342KBT1.zip

1) qtn30m640plc.xls – Ladder front cover sheet

- 2) 342KBT1.doc -- Ladder Document 2.5 megabyte.
- 3) ECN756.xls -- ECN information. New parameters, etc.
- 4) 342kbt1.gpg -- Ladder bin file. Only used by Mazatrol/Engr
- 5) Ten342B3.lpc -- LGP file has machine menu and alarms
- 6) Gramnt*.bmp -- Bitmap files of machine used with the lpc and ladder to have maintenance display.



Mazatrol Fusion 640 (M) Version Form.

Mach: S/N:

TO ACCESS THE VERSION PAGE:

A) PRESS DISPLAY SELECT BUTTON. B) PRESS DIAGNOS MENU BUTTON. C) PRESS VERSION.

UNIT FCU6-		SERIAL:		MODEL:	
WINDOWS 95 PRODUCT ID:					
ITEM	VERSION	ITEM	VERSION	MOTOR	MACHINE
MAIN-A		SRV-X			
MAIN-B		SRV-Y			
LG-		SRV-Z			
LADDER		SRV-4			
LGP ENG		SRV-5			
		SRV-6			
		SPN-1			

J2CT-1	
J2CT-2	
J2CT-3	
J2CT-4	
J2CT-5	
J2CT-6	
J2CT-7	

PRESS OPTION MENU BUTTON TO ACCESS OPTION PAGE.

MARK THE OPTIONS WHICH ARE ACTIVE.

1 <input type="checkbox"/> EIA	19 <input type="checkbox"/> 3-D CO-OR ROT.	37 <input type="checkbox"/> SCALE F/B (A)
2 <input type="checkbox"/>	20 <input type="checkbox"/> AUTO TLM	38 <input type="checkbox"/> CYLINDER
3 <input type="checkbox"/> SPIRAL	21 <input type="checkbox"/>	39 <input type="checkbox"/>
4 <input type="checkbox"/> EIA 3D COMP.	22 <input type="checkbox"/> COMPARISON STOP	40 <input type="checkbox"/>
5 <input type="checkbox"/> ROTATION	23 <input type="checkbox"/> HV CNTR.	41 <input type="checkbox"/> NAVIGATION
6 <input type="checkbox"/> GEOMETRIC	24 <input type="checkbox"/> SYNC. CONT	42 <input type="checkbox"/> IC CARD RUNNING
7 <input type="checkbox"/> SCALING	25 <input type="checkbox"/> EIA CONVERSION	43 <input type="checkbox"/> EIA HELICAL TAP CYCLE
8 <input type="checkbox"/> EXT-DATA I/O	26 <input type="checkbox"/> SPLINE	44 <input type="checkbox"/> MAZATROL HELICAL
9 <input type="checkbox"/> MAZATROL 3D	27 <input type="checkbox"/> G54.1	45 <input type="checkbox"/> PROTOCOL B
10 <input type="checkbox"/>	28 <input type="checkbox"/> SYNC.TAP	46 <input type="checkbox"/> SHAPING
11 <input type="checkbox"/>	29 <input type="checkbox"/>	47 <input type="checkbox"/> SUBMICRON SYSTEM
12 <input type="checkbox"/> 5-PLANE	30 <input type="checkbox"/>	48 <input type="checkbox"/> NURBS INTERPORATION
13 <input type="checkbox"/> HIGH SPEED	31 <input type="checkbox"/> INCH/MM CONVERT	49 <input type="checkbox"/>
14 <input type="checkbox"/> SHAPE COMP.	32 <input type="checkbox"/>	50 <input type="checkbox"/> BORING TORNADO
15 <input type="checkbox"/> THREAD	33 <input type="checkbox"/> GOO SLOPE CONST.	51 <input type="checkbox"/> MAZATROL PLANET TAP
16 <input type="checkbox"/>	34 <input type="checkbox"/> SCALE FEEDBACK	52 <input type="checkbox"/>
17 <input type="checkbox"/> INVERSE TIME	35 <input type="checkbox"/> EIA CONVERSION 2	53 <input type="checkbox"/> AUTO PECKING
18 <input type="checkbox"/> DYNAMIC COMP	36 <input type="checkbox"/> VARIABLE 600 SETS	

CUSTOMER NAME:

DATE:

MACH. TYPE :

Mazatrol Fusion 640 (MT) Version Form.

MACH: S/N:

TO ACCESS THE VERSION PAGE:

A: PRESS DISPLAY SELECT BUTTON. B: PRESS DIAGNOS MENU BUTTON. C: PRESS VERSION.

UNIT FCU6-		SERIAL:		MODEL:	
WINDOWS 95 PRODUCT ID:					
ITEM	VERSION	ITEM	VERSION	MOTOR	MACHINE
MAIN-A		SRV1-X			
MAIN-B		SRV1-Z			
LG-		SRV1-C			
LADDER		SRV1-4			
LGP ENG		SRV1-5			
		SPN1-1			
		SPN1-2			
		SPN1-3			
J2CT-1		SRV2-X			
J2CT-2		SRV2-Z			
J2CT-3		SRV2-C			
J2CT-4		SRV2-4			
J2CT-5		SRV2-5			
J2CT-6		SPN2-1			
J2CT-7		SPN2-2			

PRESS OPTION MENU BUTTON TO ACCESS OPTION PAGE. MARK THE OPTIONS WHICH ARE ACTIVE.

- | | |
|---|---|
| 1 <input type="checkbox"/> BACKGROUND PATH CHECK | 19 <input type="checkbox"/> POLAR COORDINATES INPUT |
| 2 <input type="checkbox"/> EIA/ISO | 20 <input type="checkbox"/> CYLINDRICAL INTERPORATION |
| 3 <input type="checkbox"/> CHANGE TO EIA | 21 <input type="checkbox"/> POLYGON MACHINING |
| 4 | 22 |
| 5 | 23 |
| 6 | 24 <input type="checkbox"/> ENHANCED Y-AXIS MAZATROL |
| 7 | 25 <input type="checkbox"/> SYNCHRO. MAIN SPINDLE TAPPING |
| 8 <input type="checkbox"/> 2ND AUXI FUNTIONS | 26 <input type="checkbox"/> EIA HELICAL INTERPOLATION |
| 9 | 27 <input type="checkbox"/> EIA COORDINATE ROTATION |
| 10 <input type="checkbox"/> Y-AXIS CONTROL | 28 <input type="checkbox"/> B AXIS CONTROL |
| 11 <input type="checkbox"/> SYNCHRO. MILL TAPPING | 29 <input type="checkbox"/> ENHANCED Y-AXIS MAZATROL(FACE1) |
| 12 | 30 <input type="checkbox"/> ENHANCED Y-AXIS MAZATROL(FACE2) |
| 13 <input type="checkbox"/> SCALE FEED BACK | 31 <input type="checkbox"/> EIA 1/100000 INCH DISP. |
| 14 <input type="checkbox"/> DIRECT DWG SIZE INPUT | 32 <input type="checkbox"/> GANTRY ROBOT CONTROL |
| 15 <input type="checkbox"/> USER MACRO | 33 <input type="checkbox"/> AUTO PECKING |
| 16 <input type="checkbox"/> 600 MACRO VARIABLES | 34 <input type="checkbox"/> EIA HELICAL TAP |
| 17 <input type="checkbox"/> USER MACRO INTERRUPT | 35 |
| 18 <input type="checkbox"/> WORK COORDINATES SELECT | 36 |

CUSTOMER NAME:

DATE:

MACH. TYPE:

Mazatrol Fusion 640 (T) Version Form.

Mach: S/N:

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TO ACCESS THE VERSION PAGE:

A: PRESS DISPLAY SELECT BUTTON. B: PRESS DIAGNOS MENU BUTTON. C: PRESS VERSION.

UNIT FCU6-		SERIAL:		MODEL:	
WINDOWS 95 PRODUCT ID:					
ITEM	VERSION	ITEM	VERSION	MOTOR	MACHINE
MAIN-A		SRV1-X			
MAIN-B		SRV1-Z			
LG-		SRV1-C			
LADDER		SRV1-4			
LGP ENG		SRV1-5			
		SPN1-1			
		SPN1-2			
		SPN1-3			
		SRV2-X			
		SRV2-Z			
		SRV2-C			
		SRV2-4			
		SRV2-5			
		SPN2-1			
		SPN2-2			

J2CT-1	
J2CT-2	
J2CT-3	
J2CT-4	
J2CT-5	
J2CT-6	
J2CT-7	

PRESS OPTION MENU BUTTON TO ACCESS OPTION PAGE. MARK THE OPTIONS WHICH ARE ACTIVE.

- | | |
|---|---|
| 1 <input type="checkbox"/> BACKGROUND PATH CHECK | 19 <input type="checkbox"/> POLAR COORDINATES INPUT |
| 2 <input type="checkbox"/> EIA/ISO | 20 <input type="checkbox"/> CYLINDRICAL INTERPOLATION |
| 3 <input type="checkbox"/> CHANGE TO EIA | 21 <input type="checkbox"/> POLYGON MACHINING |
| 4 | 22 |
| 5 | 23 |
| 6 | 24 <input type="checkbox"/> ENHANCED Y-AXIS MAZATROL |
| 7 | 25 <input type="checkbox"/> SYNCHRO. MAIN SPINDLE TAPPING |
| 8 <input type="checkbox"/> 2ND AUXI FUNTIONS | 26 <input type="checkbox"/> EIA HELICAL INTERPOLATION |
| 9 | 27 <input type="checkbox"/> EIA COORDINATE ROTATION |
| 10 <input type="checkbox"/> Y-AXIS CONTROL | 28 <input type="checkbox"/> B AXIS CONTROL |
| 11 <input type="checkbox"/> SYNCHRO. MILL TAPPING | 29 <input type="checkbox"/> ENHANCED Y-AXIS MAZATROL(FACE1) |
| 12 | 30 <input type="checkbox"/> ENHANCED Y-AXIS MAZATROL(FACE2) |
| 13 <input type="checkbox"/> SCALE FEED BACK | 31 <input type="checkbox"/> EIA 1/100000 INCH DISP. |
| 14 <input type="checkbox"/> DIRECT DWG SIZE INPUT | 32 <input type="checkbox"/> GANTRY ROBOT CONTROL |
| 15 <input type="checkbox"/> USER MACRO | 33 <input type="checkbox"/> AUTO PECKING |
| 16 <input type="checkbox"/> 600 MACRO VARIABLES | 34 <input type="checkbox"/> EIA HELICAL TAP |
| 17 <input type="checkbox"/> USER MACRO INTERRUPT | 35 |
| 18 <input type="checkbox"/> WORK COORDINATES SELECT | 36 |

CUSTOMER NAME:

DATE:

MACH. TYPE:

MAZATROL FUSION 640 N.C. SOFTWARE CLAIM REPORT

Reporter : _____ Report# _____
 Department : _____ E-Mail Address : _____
 Date: _____ Attached Data: _____

Customer :											
Machine Type:						S/N:					
N.C. Type	M640	M	<input type="checkbox"/>	T	<input type="checkbox"/>	MT	<input type="checkbox"/>	TTE	<input type="checkbox"/>		
Software	NC Main	A	→	[]			Ex:	NC Main	A	→	[360W000-A0]
Version	NC Main	B	→	[]				NC Main	B	→	[360W001-A0]
	PLC Ladder		→	[]				PLC Ladder		→	[40SW102-0500]
	LGP-ENG		→	[]				LGP-ENG		→	[410W032-5]

Please send all data (Program, Tool Data, Parameter and etc...) via. E-Mail

Must Be E-Mail, with the data saved in DOS FILE FORMAT.

Please note when you send the report without necessary file data, Japan will not investigate.

Note: Please give the description with careful usage of IN, OUT, WHEN, IF should have and so on.

When the problem can be illustrated or shown by numerical values, please provide all data.

Such as GRAPHIC/POSITION/COMMAND DISPLAYS

1) Contents of problem: 2) Occurrence condition (Duplication Procedure): 3) Alternative method:

Questionnaire:

1). Occurrence rate (%) ?

Percentage Rate

2) Method of problem duplication?

Yes or No

3) Problem has been resolved by alternative programming/operating or explanation to the customer?

Yes or No

4) Software has to be corrected for the customer's

Yes or No

5) Priority of the software

Select From Drop Down List

6) Other remarks or more

M640 Software -B Version Main Update Procedure.doc

last revised 7/20/99.

1. Back up all data See Appendix –A. Reference all axis to Home Position.
Check version and compare with new software. See Item 15 on next page
Power off control and main breaker.
Note: When updating from A-version to B-version the Maintenance Tool and MRJ2 software should be updated also.

Reinitialize Control

- 1B. Set the blue Rotary Switch on back of CNC to 7, and power on control to reinitialize control. See Appendix-B for complete procedure. But only do first part before reloading parameters, Steps 1 thru 4. Power off control and reset back to 0 and power on again.

Closing Down Mazatrol software and Uninstalling

- 1C. When control comes up, close out the Mazatrol software by pressing MF1 and letter O. Click on the M64ATMAIN and select END TASK. Alternate method shown in Appendix-C
- 1D. Next, click on the START key and go to PROGRAMS, MAZATROL FUSION 640, and Uninstall. This will remove the Mazatrol software. (See Appendix-D for more detail)

Installing New Maintenance Tool Files(If Needed)

- 1E. If new Maintenance Tool software diskette is supplied, copy the 3 files from the floppy to C:\Mainte\ directory using Windows Explorer. In some cases you may find a mainte.bat on the diskette and it will automatically copy the appropriate files for you.

Installing New MrJ2 Software Version A2(If Needed)

- 1F. If MRJ2 software diskette is supplied, A2 version for Version B update, simply Click on the Setup.exe on diskette.

Main-B software (Floppy Diskettes).

2. Using Windows Explorer go to the C:\mainte\mainte.exe file and execute. This will call up the new maintenance software you installed in step 1E.
Under APPLICATION SOFTWARE UPDATE, click on INSTALL to update by floppy diskette.

Note: If you have Main-B software on flash card, see Appendix E on where to put the appropriate Disk1 thru 6 data. This is only for the two internal PcMcia slots.

3. Insert Disk 1 (there should be 6 or more disks) of the Version upgrade s/w into the floppy disk drive and click on OK to install. It will ask if you are sure you will be replacing any backed up data under C:\NCbackup\Disk1 thru 6. Answer OK.
The software will create a backup of these diskettes automatically under Ncbackup.
4. When setup is finished, click ok. **Exit the Windows software by clicking on Start menu and Select SHUT DOWN.** Turn off the NC power and the main breaker.

Main-A(HR401)

5. Open the back cover of the NC unit and plug the Version upgrade ROM cassette (HR401) into the CBUS2 slot located at the far most right end of the control.

6. Set the NC rotary switch (located on the bottom of the HR113 card) to “8”.

7. Turn on the main breaker and then turn on the CNC power.

8. The seven segment LED display (located next to the NC rotary switch) changes from “L” to “P” and finally to “Y”. This procedure is completed when display is “Y”. This should take about two minutes.

9. Turn off the main breaker, (The CNC power-off button does not work.)

10. Reset the NC rotary switch back to “0” and pull out the ROM cassette. Power on machine and control.

11. Power on control and reload the **PARAMETERS** only.

11a. Set any new parameters and **save to Flash Ram** using Maintenance Tools.

When going from A to B on lathes, set O41 to 112. B265(Hd1 no. of chuck jaws) and B266(Hd2 or sub-spindle no. of chuck jaws) normally set to 3.

P94 = 60 FOR (T) NC DATA TO HARD DRIVE Interval Save Time.

L99 = 60 FOR (M) NC DATA TO HARD DRIVE Interval Save Time.

12. Go to “Diagnos” and select “Data Erase”. Select all items and select “Apply”. Type in **-9999** and press **Input**.

13. Power off/on control. If have MrJ2 drives, may need to power off/on twice.

14. Reload the rest of the saved data(Tool data, Programs, Cutting Conditions, etc).

14a. Load in Navipara.txt data for lathes if update from A version. See M640_Navipara.doc

15. Check version page for correct version combination:

For Quadrex,Mpx, DTurns, and Igx200sy will be :	Main A 369W000-**
	Main B 369W001-***
For any other lathes including Igx200my will be:	Main A 365W000-**
	Main B 369W001-***
For Any Machining center will be:	Main A 360W000-**
	Main B 360W001-***

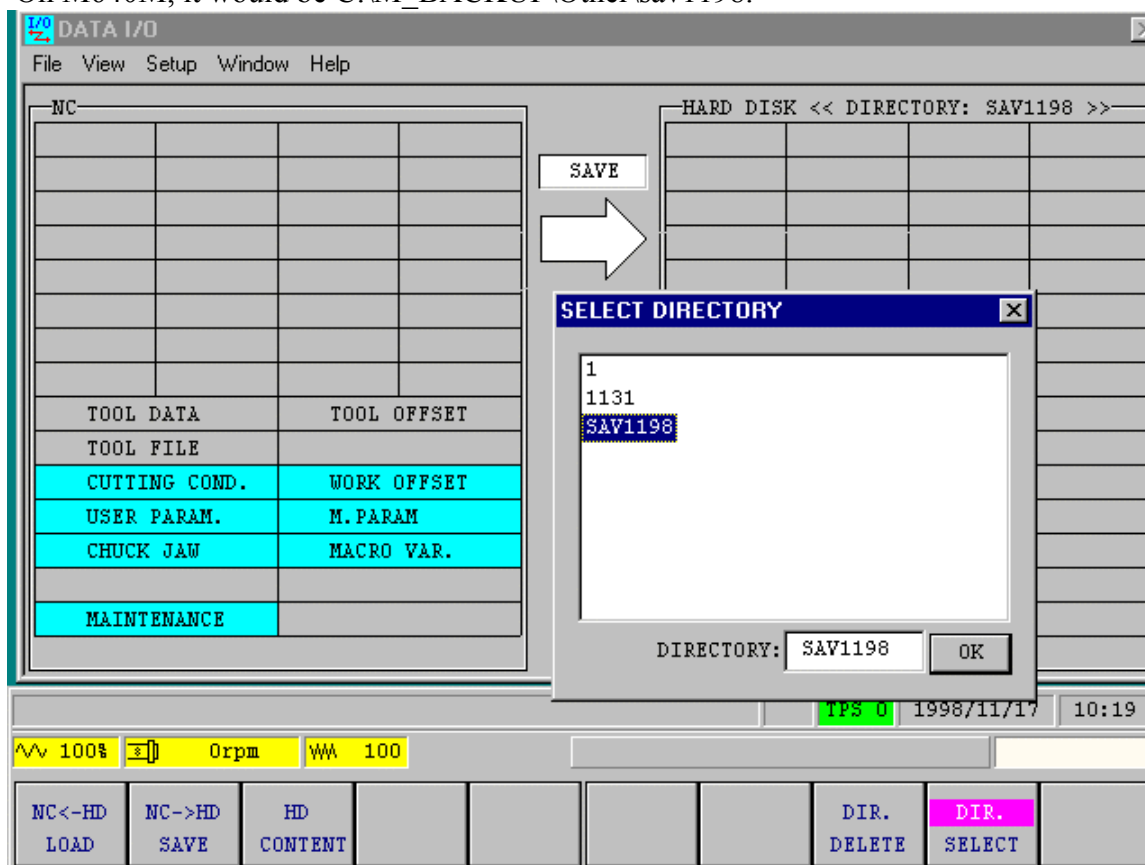
Note: Look at versions before starting update. Must be same 365/369 or 369/369 combination.

**** is version of HR401 for Main A , *** is version of Floppy Disks for Main B**

Appendix - A

Saving/Reloading parameter, cutting condition, maintenance data to hard drive.

- 1) Select "Data IN/OUT".
- 2) Press "HARD DISK".
- 3) Select "DIR.SELECT" and type in directory. My suggestion is to use SAV1198 for data saved in November of 1998. This directory can be found in the C:\T_BACKUP\Other\sav1198 on M640T.
On M640M, it would be C:\M_BACKUP\Other\sav1198.



- 4) After directory is selected, press the "NC->HD SAVE" button. Select the files to be saved by bringing cursor down and hit INPUT key which will highlight in blue.
- 5) Press "START" and it will highlight and go out when saved.
- 6) Confirm files are saved by pressing the "HD CONTENT" and "START".

Note: If you Save Again in same directory, it will Erase the existing contents first and then Save the new data. (Just like the Micro-Disk does)

- 1) To reload data, simply do DIR. SELECT, select directory and press OK. Press "HD CONTENT" and "START". Then "NC <- HD LOAD", and "Start".

APPENDIX- B Reinitialize Control

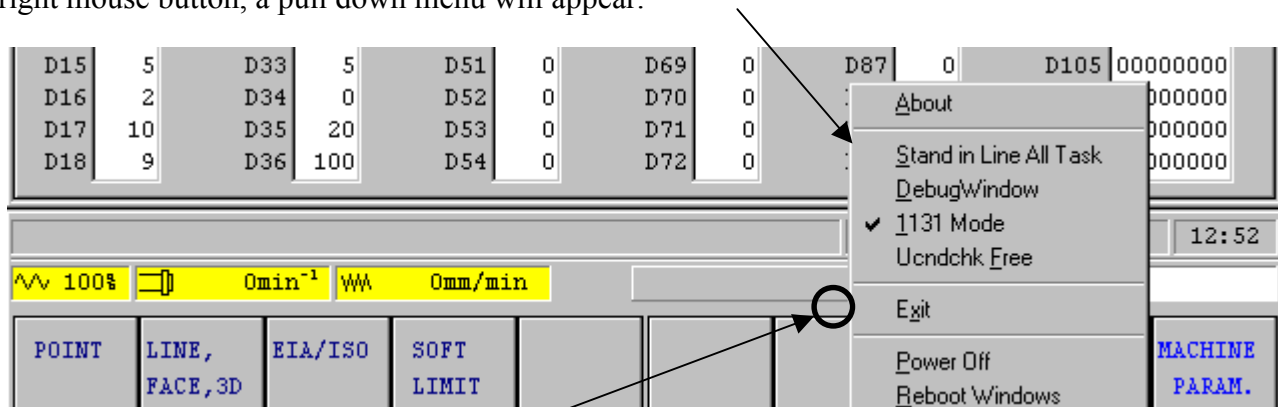
1. Power off control.
2. Data should have been backed up by APPENDIX-A. Set blue rotary switch to "7".
3. Power on control. The 7-segment LED above the switch will change as follows

very quickly 8-> 0-> 1 -> 2 -> 3 -> 4 -> 5 -> Y.

4. Power off control. Reset the rotary switch back to “0” position.
5. Power on control and reload the **PARAMETERS** only.
6. Go to “Diagnos” and select “Data Erase”. Select all items and select “Apply”.
Type in **-9999** and press **Input**.
7. Power off/on control. If have MrJ2 drives on this machine, power off/on twice.
8. Reload the rest of the saved data(Tool data, Programs, Cutting Conditions, etc).

Appendix C – Alternate way of Shutting Down Mazatrol Software

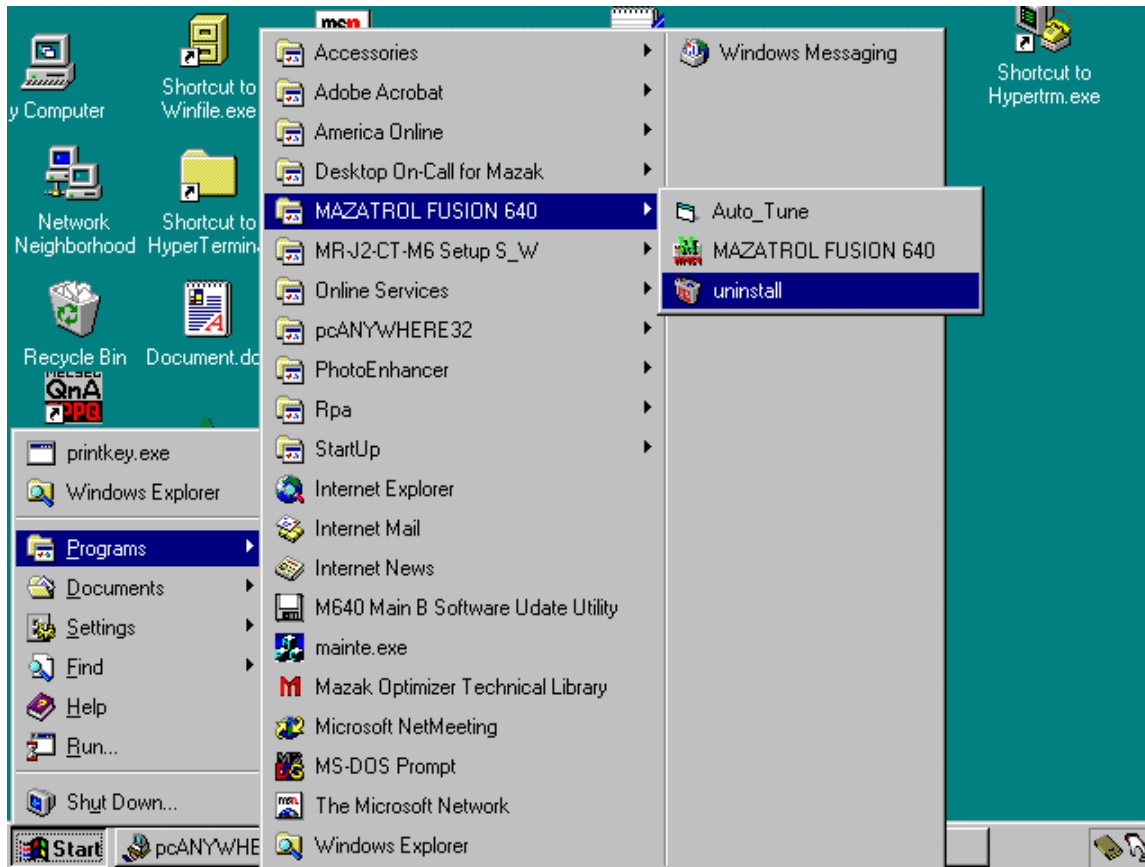
1. Press the PARAM key and then the right end menu key. Type “1131” and press input to get into the privileged mode.
2. Move the mouse pointer to the bottom edge of the message indication column. By pressing the right mouse button, a pull down menu will appear.



Bring the mouse pointer to this point

3. Select EXIT and press the right side mouse button.

Appendix D- Showing how to Uninstall Mazatrol Software

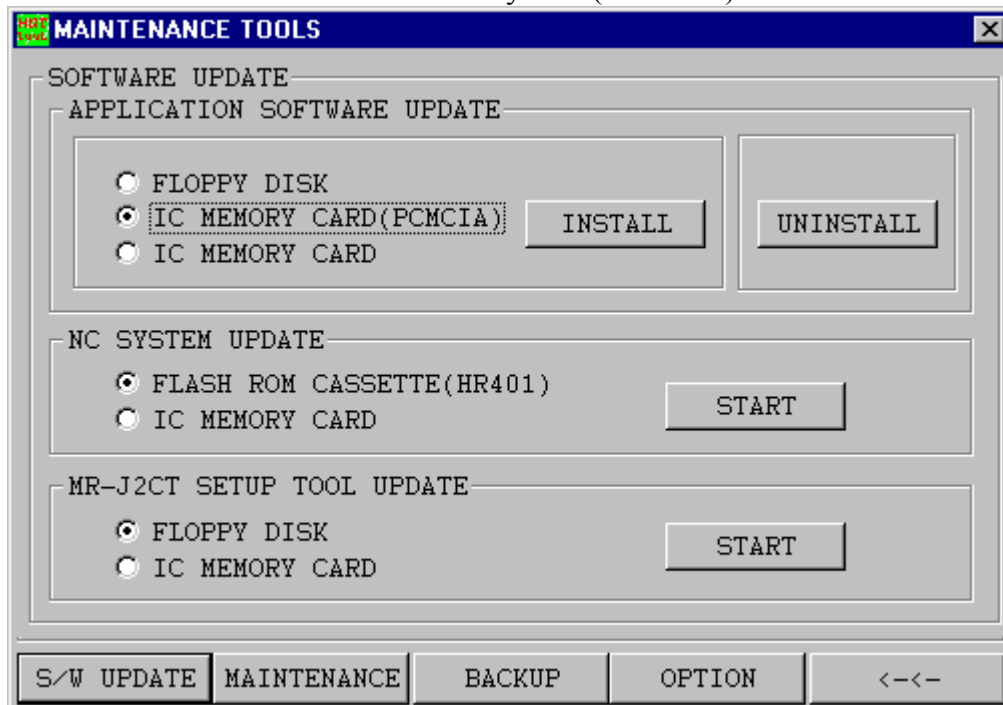


**Click on Start, Programs, Mazatrol Fusion 640, and Uninstall.
Make sure the Mazatrol
Software is shut down(END TASK).**

APPENDIX – E

With new Maintenance Tool it is possible to load the Main B software from the internal 2-slot PCMCIA slots. NOT FROM THE FRONT SLOT.

Below illustrates to activate IC Memory Card(PCMCIA).



[Folder Location]

\verup\atsys\DISK1
 \DISK2
 \DISK3
 \DISK4
 \DISK5
 \DISK6

M640 Re-Initialization Procedure.doc

- 1) Backup the programs, cutting conditions, tool data, maintenance, and parameter information. See M640_Data_Save_Procedure.doc for more detail.
- 2) Zero return all axis and power off the control and machine.
- 3) A blue rotary switch is located beneath the CNC unit on the HR113 card.
- 4) Set that rotary switch from “0” to “7”.
- 5) Turn the NC power ON. The 7-segment LED located above the switch will change as shown below:
8 -> 0 -> 1 -> 2 -> 3 -> 4 -> 5 -> Y.
This will happen extremely quickly.
- 6) Turn off the NC power.
- 7) Return the rotary switch back to “0” position.
- 8) Power on the control and reload the parameter information first.
- 9) Power control off/on.
- 10) Go to Diagnos, and press DATA ERASE. Click on everything to erase and press the Apply. Type in -9999 and press INPUT.
- 11) Go to Program, Program File, and select All Erase.
Type in -9999 and press Input. This clears the program file area.
- 12) Reload the rest of the data.

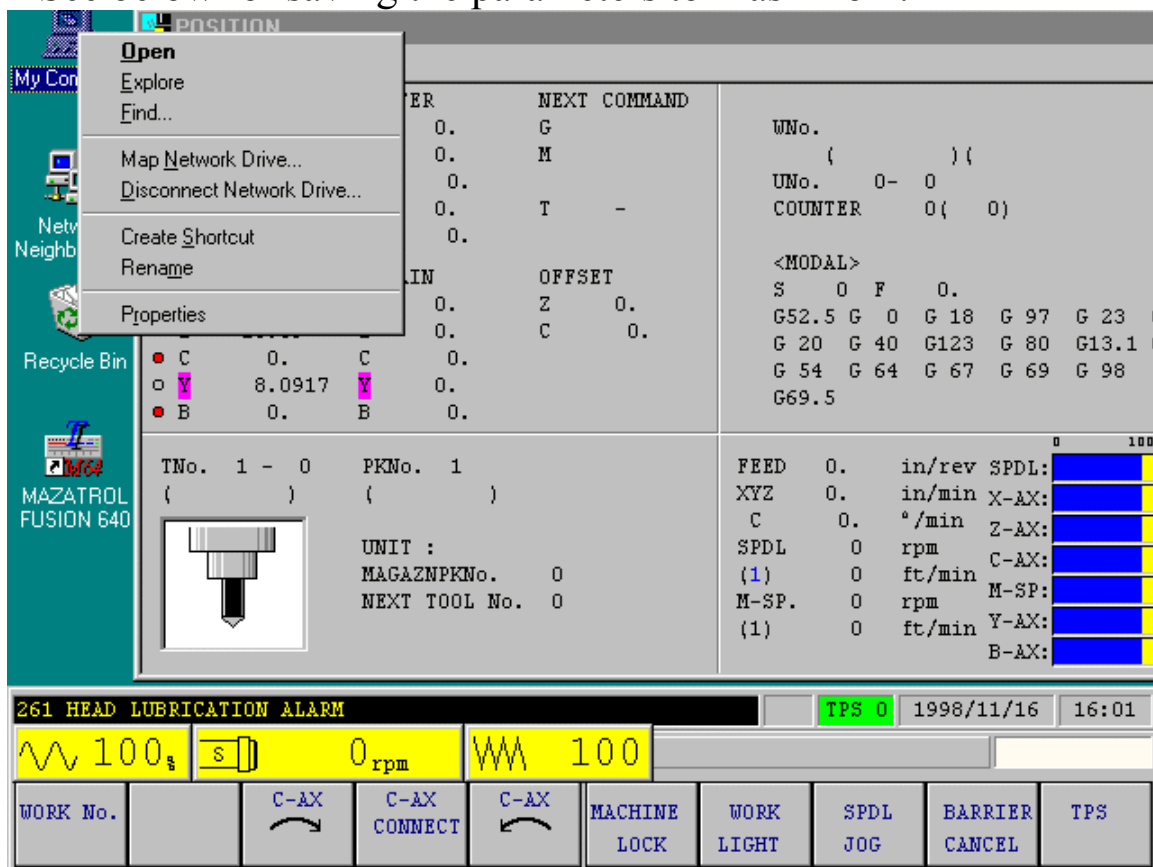
M640 Data Save Procedure.doc

The following procedure shows how to save parameters to the Flash Rom and/or hard drive for the Fusion controls.

If an O-parameter is changed on the M640 control, you must save the changed parameters to the Flash Rom located on the HR113 card. It is soldered on the card and not removable like the Plus series controls.

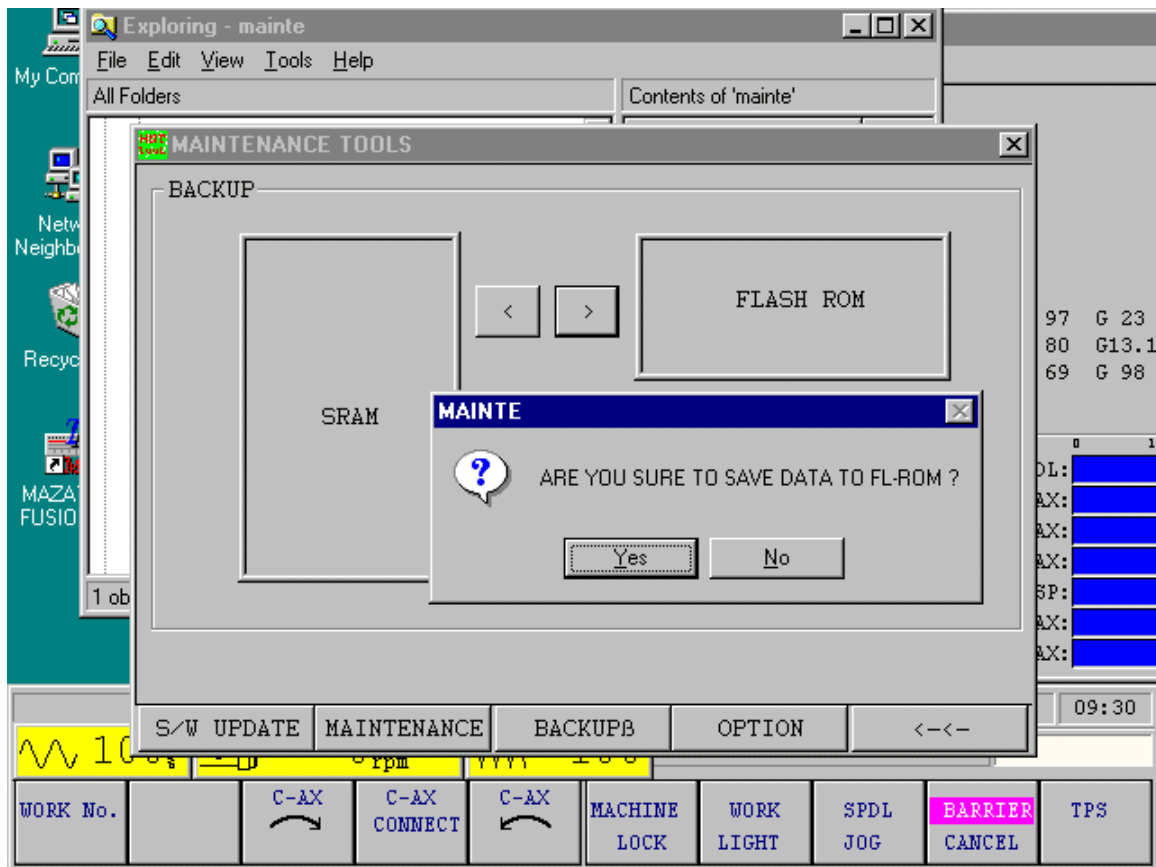
A new feature is the capability to save the parameters, cutting conditions, maintenance data to the control's hard drive. This would be advisable to do at machine installation time.

See below for saving the parameters to Flash Rom.



Click on the upper blue part of screen and drag off to side.

Click on the "MyComputer" icon once, and then click with right mouse key. Find the mainte.exe file on C:\mainte\ directory.



Select the BACKUPB.

Click on the > symbol going to the FL-ROM. Display will ask you if you are Sure, select Yes.

When done saving, it will say “Success”.

Close all open Windows by clicking on the X in the upper right corner.

Power off/on.

Saving parameter, cutting condition, maintenance data to hard drive.

-
- The screenshot shows the 'DATA I/O' screen with a menu bar (File, View, Setup, Window, Help) and a main window divided into two panes. The left pane, titled 'NC', contains a directory tree with the following structure:
- | | | | |
|---------------|-------------|-------------|--|
| TOOL DATA | | TOOL OFFSET | |
| TOOL FILE | | | |
| CUTTING COND. | WORK OFFSET | | |
| USER PARAM. | M.PARAM | | |
| CHUCK JAW | MACRO VAR. | | |
| MAINTENANCE | | | |
- The right pane, titled 'HARD DISK << DIRECTORY: SAV1198 >>', is empty. A 'SAVE' button with a right-pointing arrow is positioned between the two panes. A 'SELECT DIRECTORY' dialog box is open in the foreground, showing a list of directories: '1', '1131', and 'SAV1198' (which is highlighted). The dialog box has a 'DIRECTORY:' field containing 'SAV1198' and an 'OK' button. At the bottom of the screen, there is a status bar with fields for '100%', '0rpm', '100', 'TPS 0', '1998/11/17', and '10:19'. Below the status bar is a row of function buttons: 'NC<-HD LOAD', 'NC->HD SAVE', 'HD CONTENT', 'DIR. DELETE', and 'DIR. SELECT' (which is highlighted in pink).

M640 Data Save Procedure.doc 12/23/99 1:54 PM

M640 Parameter Servo Spindle O PitchError.doc

Locating Servo Parameters

- Press parameter key
- Right menu key
- 1131 ENTER
- Diagnose
- Version
- Servo Monitor
- Param.
- *To change to Axis 4, 5, and 6 on M640M, select Param. again to Unhighlight the Param. and then Page forward arrow key. Then select Param. again to see Axis 4,5, and 6 parameters.*

Locating Spindle Parameters

- Press parameter key
- Right menu key
- 1131 ENTER
- Diagnose
- Version
- Spindle Monitor
- Para.

Locating “O” and Pitch Error Parameters

- Press parameter key
- Right menu key
- 1131 ENTER
- Diagnose
- Version
- Version (*Right menu key labeled version*)
- Select System Param. for “O” parameters and Pitch Error accordingly.
- *Save to Flash Rom after Changing. Even though changes, will not be active till saved.*

Note: Privilege mode only needs to enter once to perform all these procedures. If the 1131 will not enter after selecting right menu key, you may already be in privilege mode.

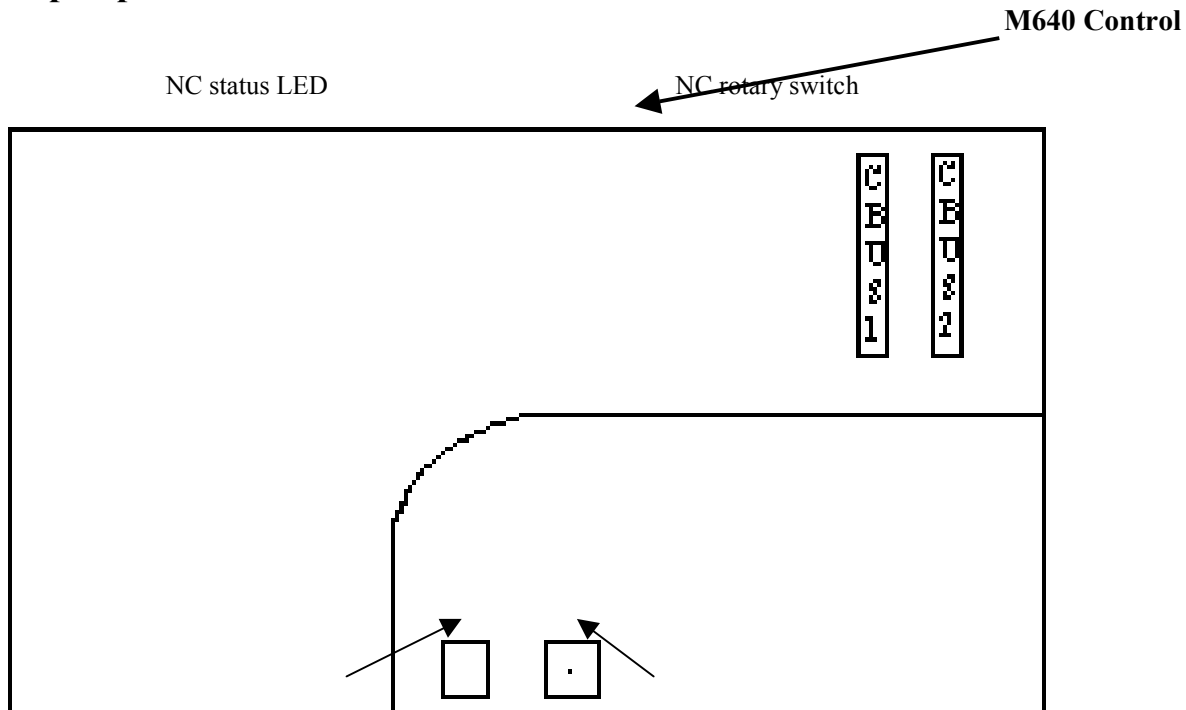
M640 Servo Update Procedure.doc

M640 SERVO/SPINDLE SOFTWARE

Tools needed:

- M640 Servo/Spindle s/w download tools cassette (QX812)
- M/T plus servo/spindle s/w cassette (QX81_)

1. Power down the control and the main breaker. Open control panel.
2. Set the NC rotary switch to “F”
3. Open plastic door to reveal CBus1 and CBus2.



4. The servo/spindle s/w cassette goes in the CBUS1 slot. The M640 s/w downloader tool cassette goes in the CBUS2 slot.

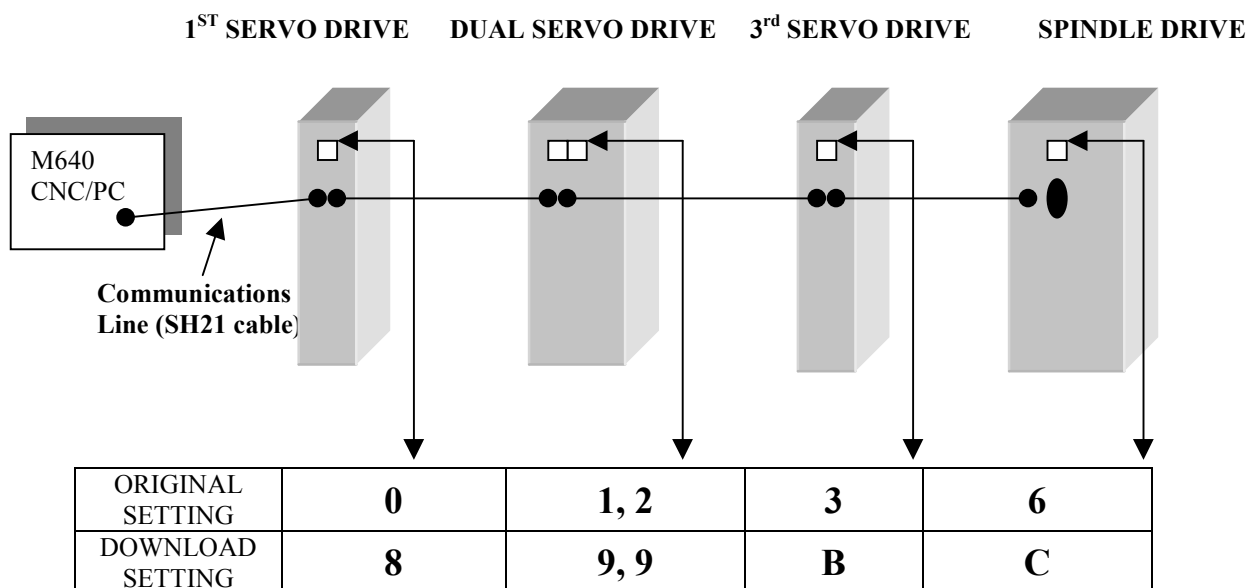
Note: Presently on Mpx or Dturn systems with two heads, it is necessary to update Hd1 servo's first, and then power off and move the serial bus cable from Hd1 servo to Hd2 servo's and update Hd2 drive.

5. Now set the rotary switches on the servo or spindle drives, depending on which s/w you are updating

- If you are updating the *SERVO drives*, add a value of 8 to the existing setting on the rotary switch of the first servo in the line of communications. The next servo drive should be set to the next higher value. If it is a dual servo drive the setting should be the same for both rotary switches.
- If you are updating *SPINDLE* drive , you must change the rotary switch to “C”. If you have more than one spindle drive set the others to “D”, “E”, etc. respectively. In other words, just add 1 to the previous spindle drive download setting.

Note: The above apply to the smaller SVJ and SPJ's, but they are a different version software. Don't put SPJ software in a SP and vice-versa. Don't mix SVJ in SV drives either.

EXAMPLE OF ROTARY SWITCH SETTINGS



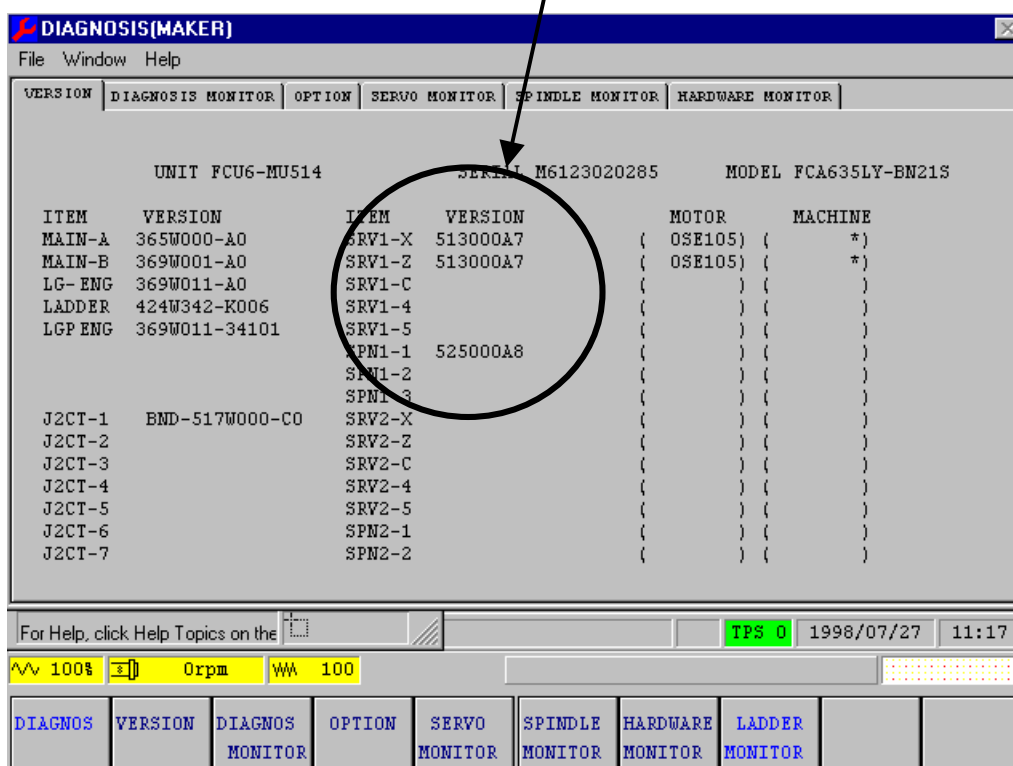
6. Turn on the main breaker and power up the control.

7. Watch the operation status on the NC seven-segment display. There will be no display on the LCD.

- The operation status is displayed as:

STEP #	CONTROL STATUS	LED DISPLAY
1	ERASING	E
2	DOWNLOADING	d
3	PROGRAMMING	P
4	DOWNLOADING	d
5	PROGRAMMING	P
6	COMPARING	C
7	NORMAL FINISH ABNORMAL FINISH	Y E = error

- Power down the control and remove the s/w cassettes. Return all rotary switches to their original positions.
- Power up the control and verify, by looking at the version screen, the s/w version did change to the new number.



- Current Versions as of November 4, 1999

Spindle

MDS-B-SP	BND-525W000	AE/AD
MDS-B-SPJ	BND-527W000	A6/A5
MDS-B-SPH	BND-525W002	B3/B2
MDS-A-SP	BND-520W000	AE/AD , Plus only
MDS-A-SPJ	BND-522W000	A6/A5 , Plus only

Servo

MDS-B-V1/V2	BND-513W000	AE/AD
MDS-A-V1/V2	BND-510W000	B6/B5 , Plus only
MDS-A-SVJ	BND-511W000	E0/E1 , Plus only

MAINTENANCE CHECK PAGE DATA

The Maintenance Check data is stored on the Flash Ram area of the HR113 card and is not accessible to be changed like the Plus series controls. In order to change the data, you must first save the data to the hard drive, edit the saved file, and then Read that file back to HR113 card.

Save Data to Hard Drive:

A) Select DIAGNOS and then MAINTEN CHECK.

B) At upper left corner, click on FILE and then FILE WRITE.

The screenshot shows the 'MAINTENANCE CHECK' window. The 'File' menu is open, showing options: Hardcopy, Printer Setup, File Read, and File Write. The main table displays the following data:

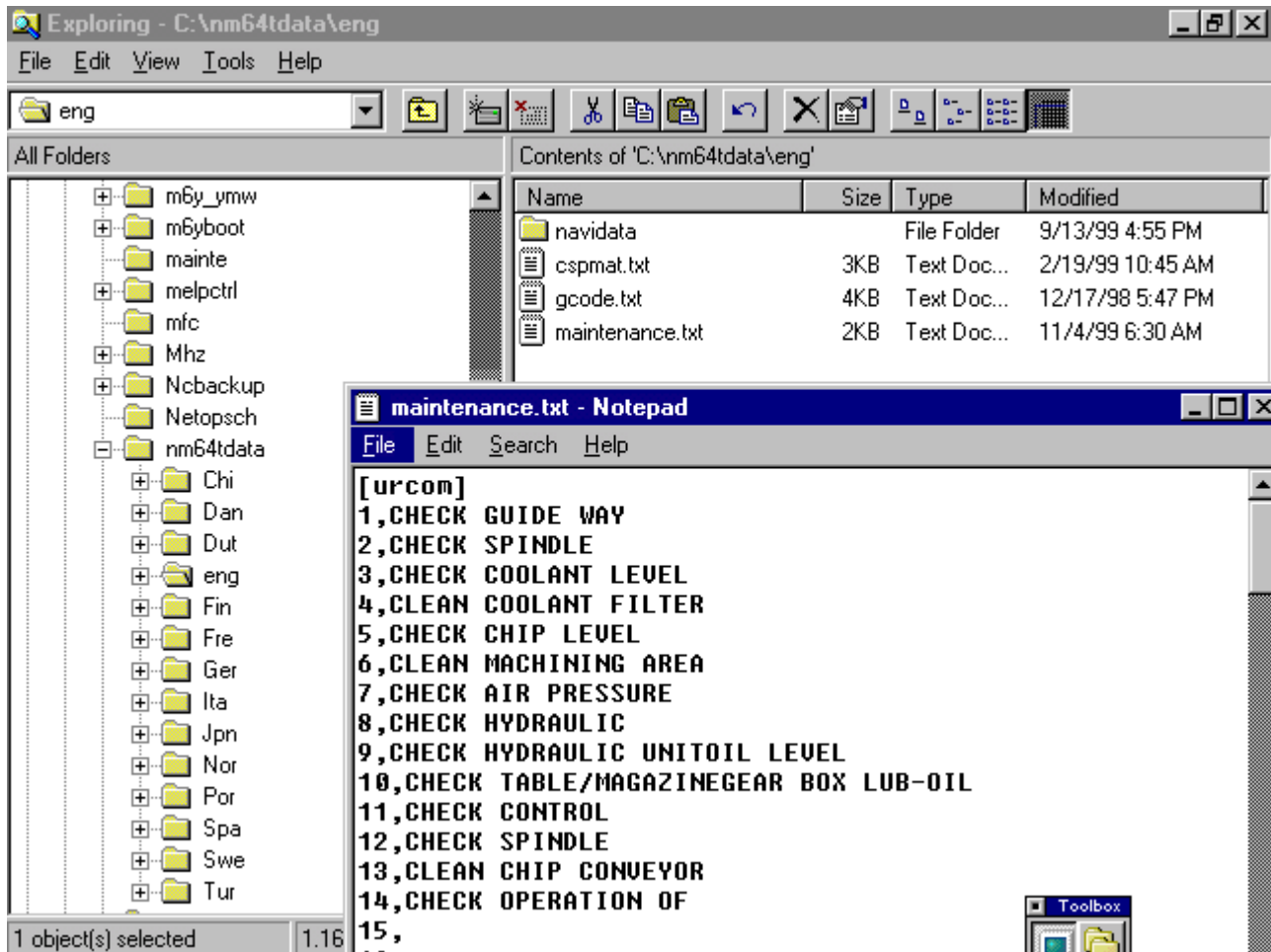
MAINTENANCE CHECK DATA		TIME (H)	PREVIOUS CHECK
CHECK ITEMS		1500	
3000-HRS CHECK ITEMS		3000	
1	CHECK GUIDE WAY	[1523]	1999.10 .12
	LUB-OIL	0	
2	CHECK SPINDLE	[1523]	1999.10 .12
	LUB-OIL	0	
3	CHECK COOLANT LEVEL	[1523]	1999.10 .12
		0	
4	CLEAN COOLANT FILTER	[1523]	1999.10 .12
		0	
5	CHECK CHIP LEVEL	[1523]	1999.10 .12
	IN CHIP BUCKET	0	
6	CLEAN MACHINING AREA	[1523]	1999.10 .12

At the bottom of the screen, there is a status bar showing: 15 SYSTEM MALFUNCTION (81, 15,) TPS 0 1999/11/04 06:27. Below this, there are buttons for POSITION, DIAGNOS, and LONGTERM DATA. A Toolbox icon is also visible.

C) The data will now be saved into the hard drive under following directory(folder).

M640M – C:\NM64MDATA\ENG\maintenance.txt

M640T --- C:\NM64TDATA\ENG\maintenance.txt



D) Once data is saved, you can click on it in Windows Explorer as shown above and edit the file. When done making changes, save changes in Notepad by selecting SAVE and then Exit by clicking on the X marks in upper right of Notepad and Explorer.

Note: IF THE "1500 AND 3000 HR" DATA MUST BE MODIFIED YOU MAY CURSOR DOWN UNTIL YOU FIND (MEI15) FOR 1500 HR CHECK LIST OR (MEI30) FOR THE 3000 HR LIST

Reading from Hard Drive to HR113 (CNC).

E) Go back to the NC mode's maintenance page as shown previously and select FILE, then FILE READ. It will now reflect your changes.

Related Parameters:

M640M- Third page of Maintenance page shown. F80 bit 3 to 1.

M640 PLC Display Explanation.doc

PLC Version Explanation for the M640 control

The plc ladder and alarm message and menus are defined as shown below. Display the DIAGNOSE Screen to see version display.

PLC Ladder Title and Version

On Display, you will see: LADDER 460W529-KA000

The 460W is a given. Numbers after 460W are broken down as follows:

First 3 digit: Model code of machine , in this case is 529.

Last 5 digit: Actual version. Previous controls could only display 3 or 4 digits.

1st : Where manufactured. In this case “K” for Ky.

2nd : Standard Revision 0 – Z .

3rd, 4th : Option 00 – ZZ (2 digits if special, 00 if standard).

5th : Option Revision Level 0 – Z.

The ladder itself is in the NC control. A backup copy may be on harddrive under c:\ Ladder\Ladder.Ldx

2) Alarm and Menu Title and Version Display

On Display, will see: LGP-ENG 360W000-52900

360W000 is a given.

First 3 digits: Model Code (529)

Last 2 digits: Revision Level 00 – ZZ

Actual text file is on hard drive under c:\m6y_ymw\Tplc

Filename in this example is MEN52900.LPC

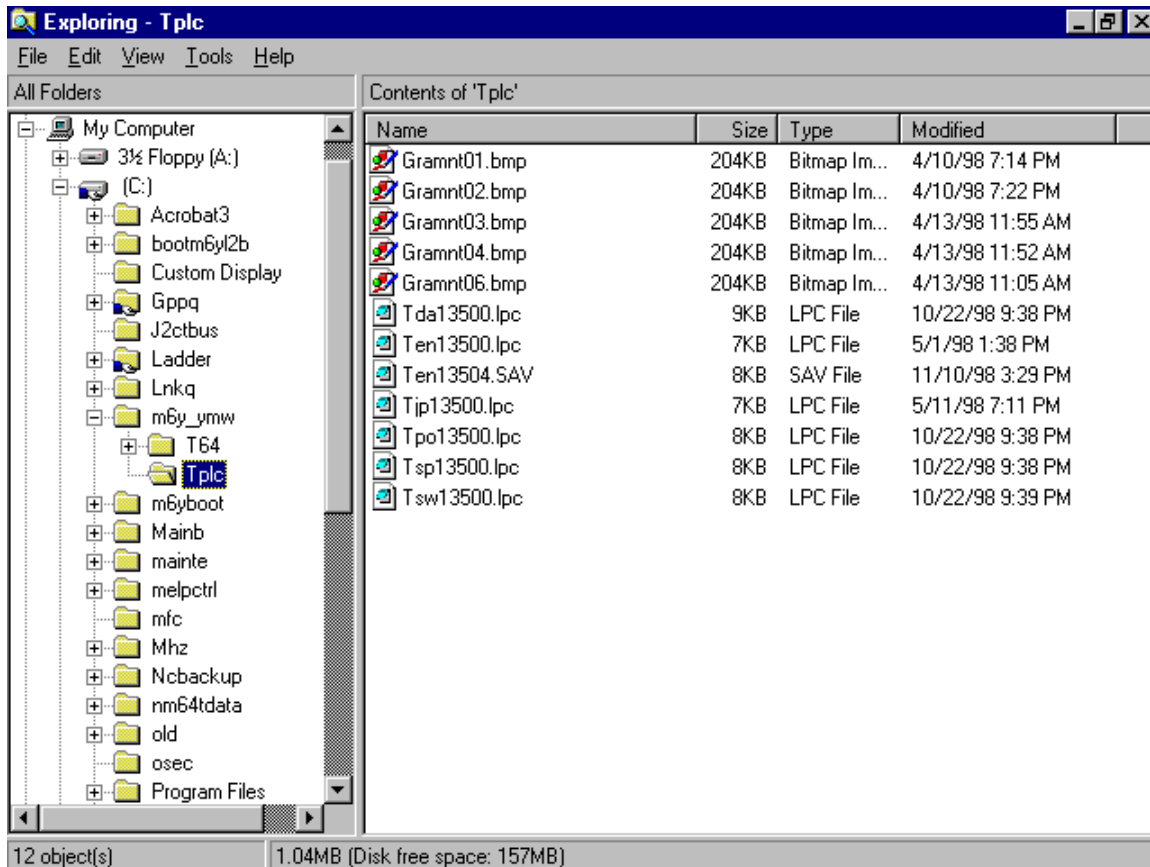
First 3 digit: M of MEN is for Machining Center

T of TEN would be for Lathes.

The EN indicates English.

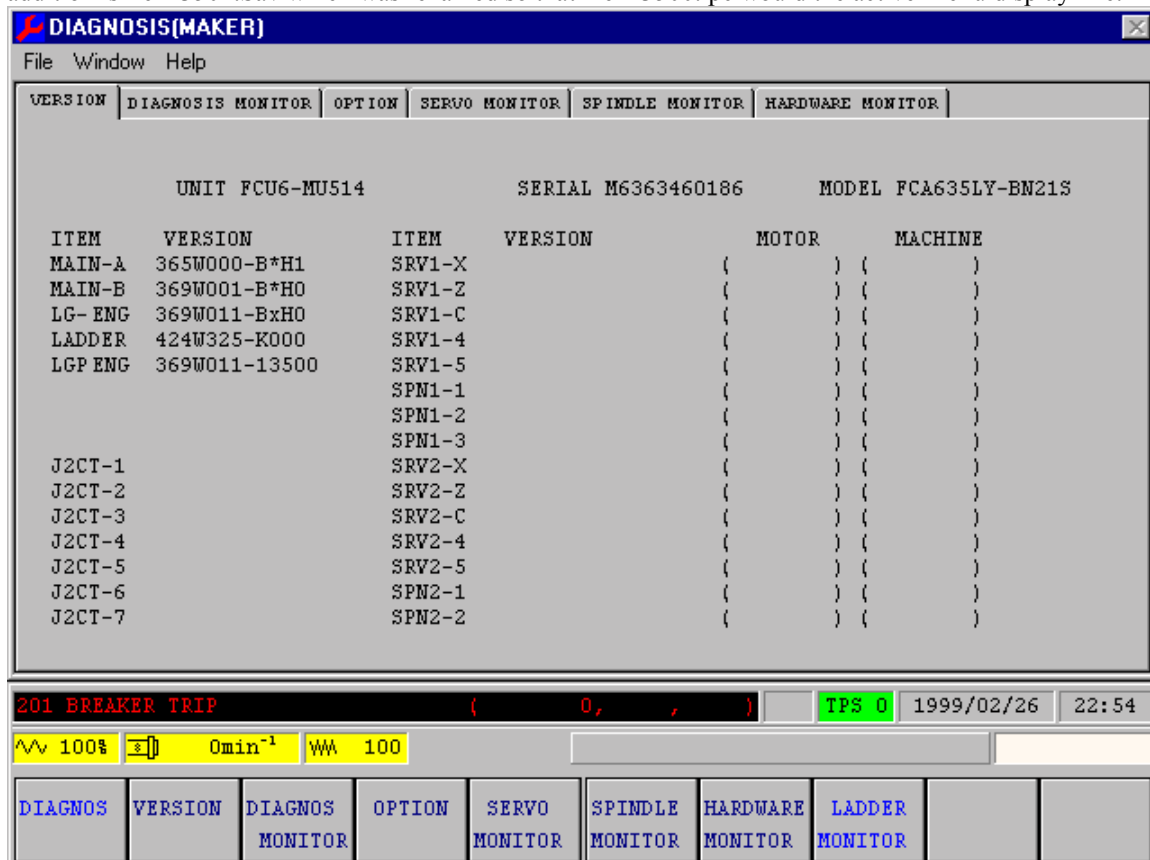
4 – 6 digit : Model code, in this case 529.

7th, 8th digit: Revision level , .LPC is extension.



Above shows a typical directory for a M640MT lathe. The BMP files are for the Graphic Maintenance.

The Ten13500.lpc file is active. You see there are menu files in Danish(Tda13500.lpc), Japanese(Tjp13500.lpc), Polish(Tpo13500.lpc), and Swedish(Tsw13500.lpc). In addition is Ten13504.Sav which was renamed so that Ten13500.lpc would be the active menu display file.



M640 PLC Corruption Recovery.doc

M640 PLC corruption recovery for M and T controls.

On Fusion 640 control, if you go to ladders and you get a Modal ID not registered alarm, the plc has been corrupted. This is usually caused by trying to load in a bad plc file that even Window's Explorer can't read.

1)Back up all data

2)Re-initialize control

Power off, set rotary switch on hr113 board to 7, NC power on, wait for display to show Y then turn off main power.

Do Not Load in parameter in till step 6!!!!

3)Turn on main power, set rotary switch to 1. (Stops plc).

***4)Turn on NC, on M640M set par K96 bit 5 to 1, NC off and on.
on M640T set par O84 to 1, NC off and on***

You should now be able to get into the ladder monitor to load the new ladder

***5)Turn off NC, you may need to shut down Windows manually.
(To shutdown manually,Press MF1 and Letter 0 and select
Shutdown.)***

6) Then power on and load parameters.

7) Turn the NC off and on, reload the remaining tool data, etc.

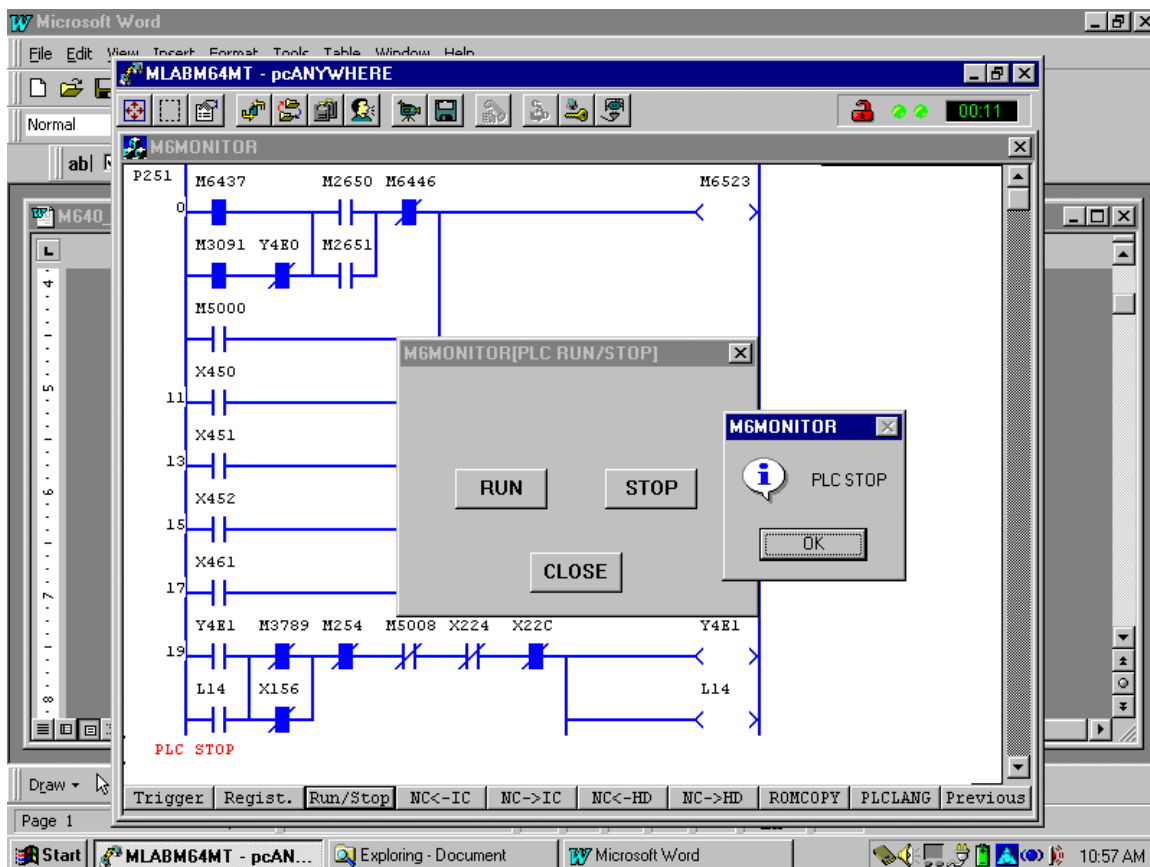
M640 PLC Saving Floppy.doc

Procedure to save the plc ladder to a floppy diskette

When installing a new machine, please have your serviceman save the ladder(ladder.ldx file) and the accompanying *.lpc files.(See M640_plc_display_explanation.doc for filename explanation).

To save the ladder and the menu files(*.lpc) do the following:

- 1) Insert the Blank formatted diskette into the Floppy Drive
 - 2) Press “Diagnos” menu key.
 - 3) Press “Version” menu key.
 - 4) Press “Ladder Monitor” menu key.
 - 5) Press “Tool” menu key.
 - 6) Press “Run/Stop” menu key.
 - 7) Select “Stop”
 - 8) Select “OK”
- PLC STOP is displayed, lower left.



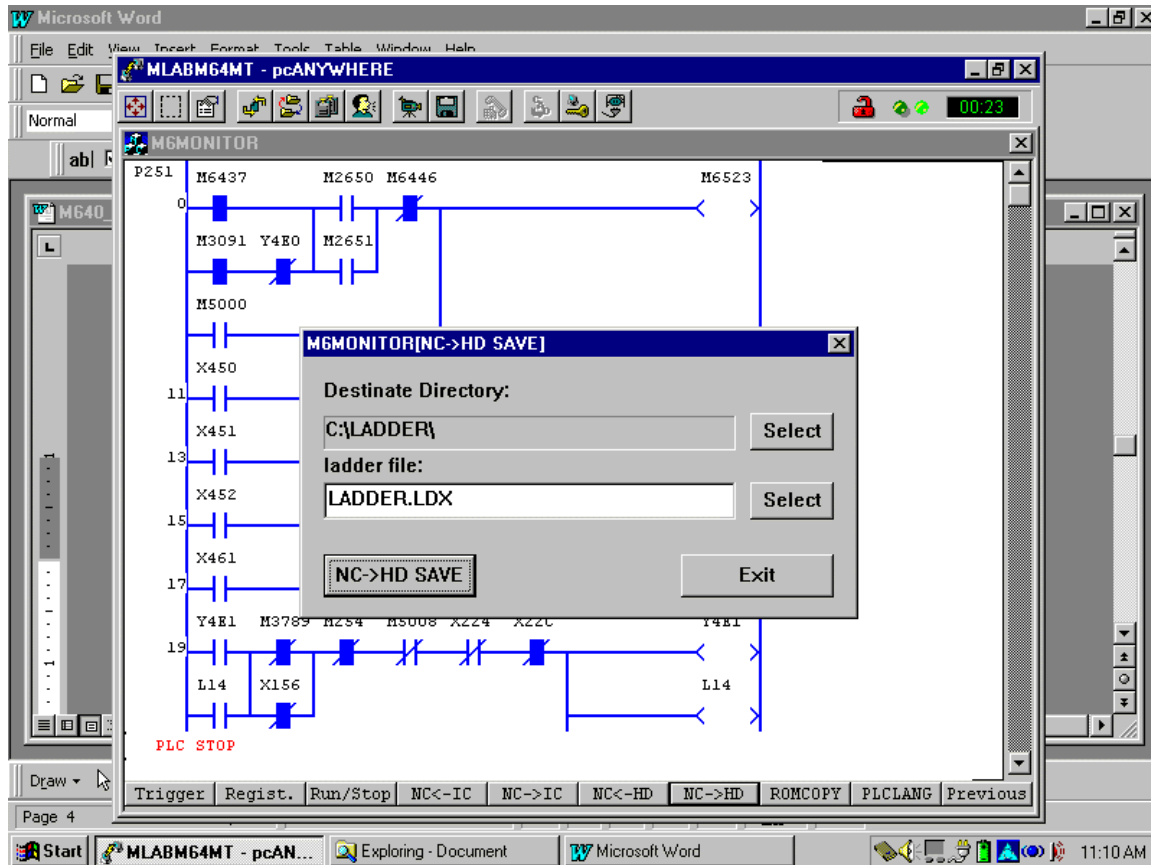
- 9) Select “CLOSE”

10) Select “NC -> HD” to save to formatted floppy diskette.

You must first “MAKE DIRECTORY”

11) To make a directory, click on select.

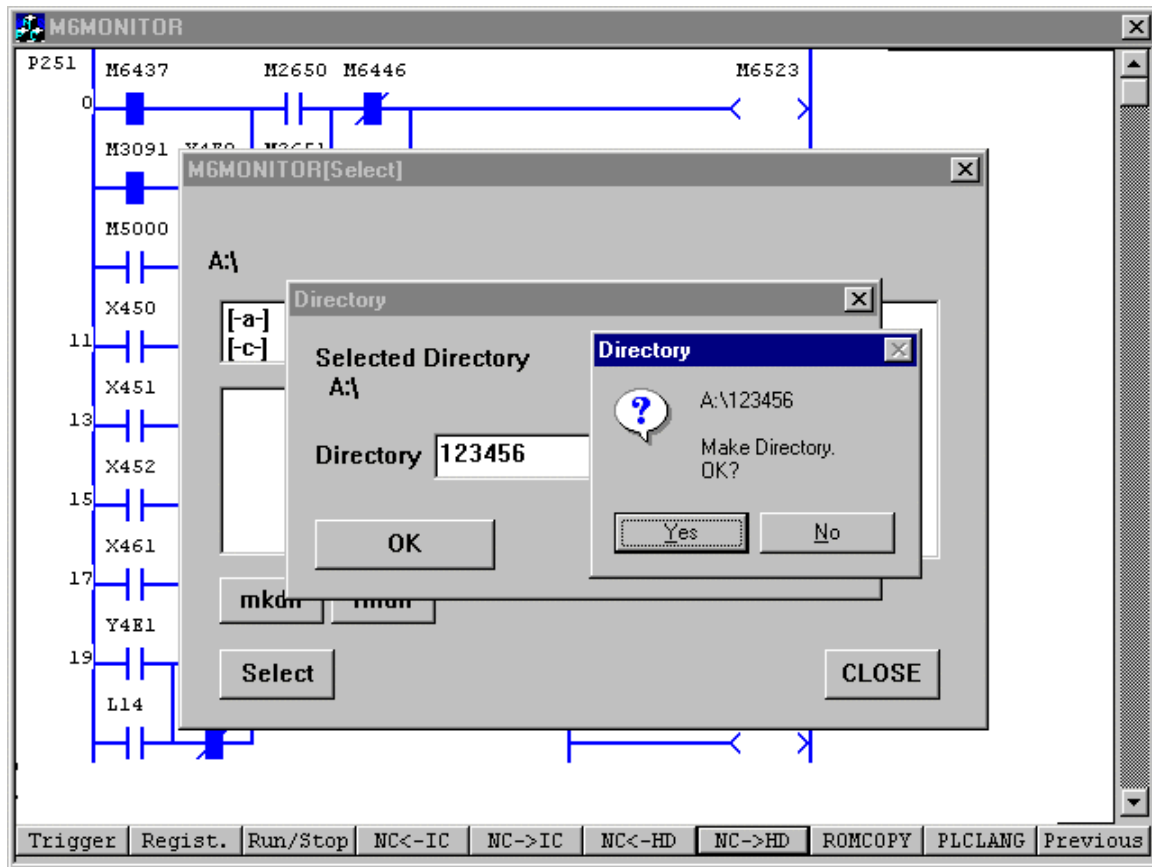
The upper select, and to the right of Destinate Directory



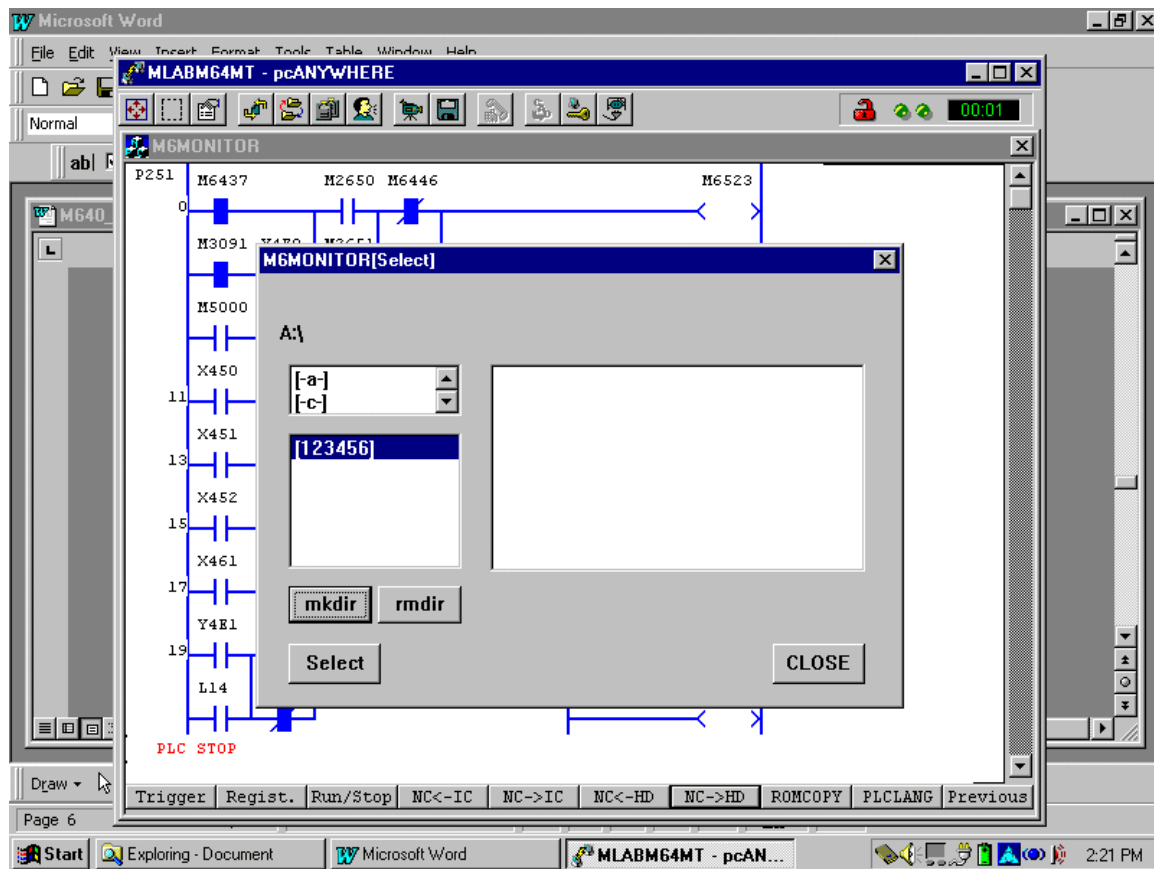
12) Double Click [-a-] drive, then select mkdir (Make Directory)

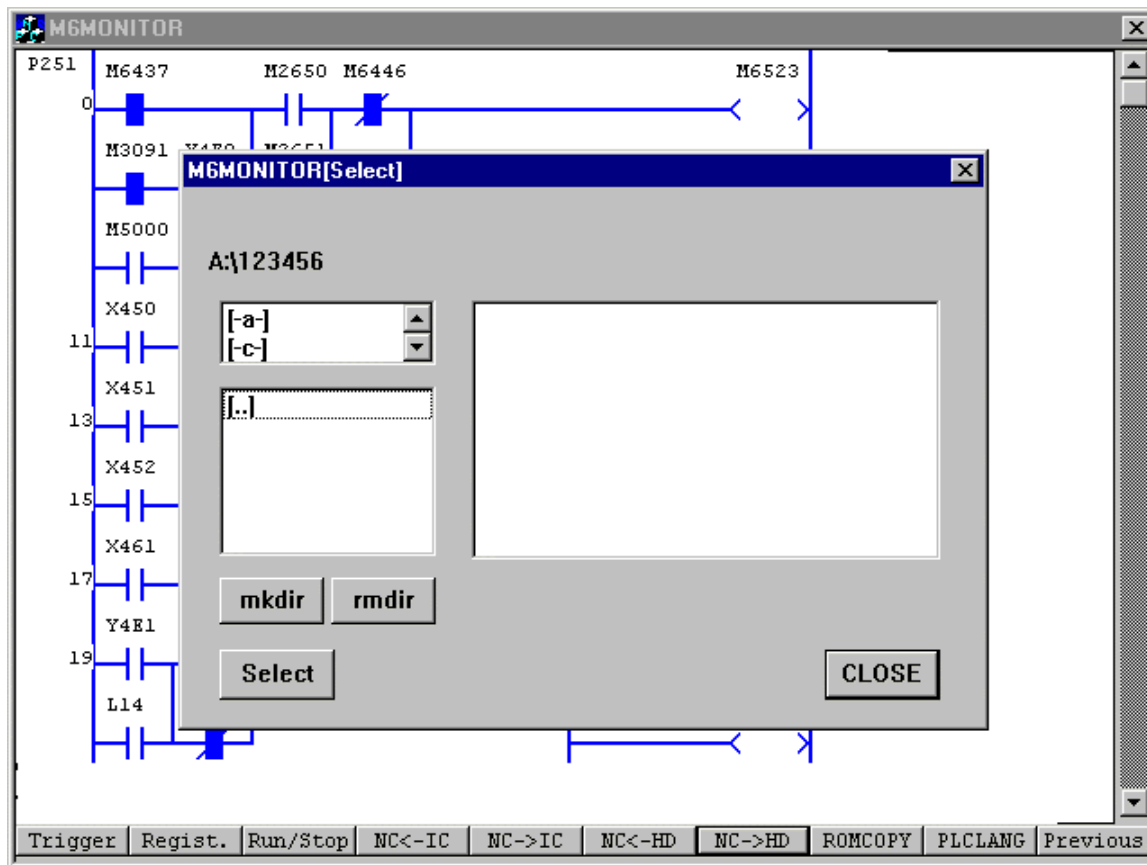
13) Enter S/N of machine for the Directory Name. Select OK and Yes.

(See Display Below)

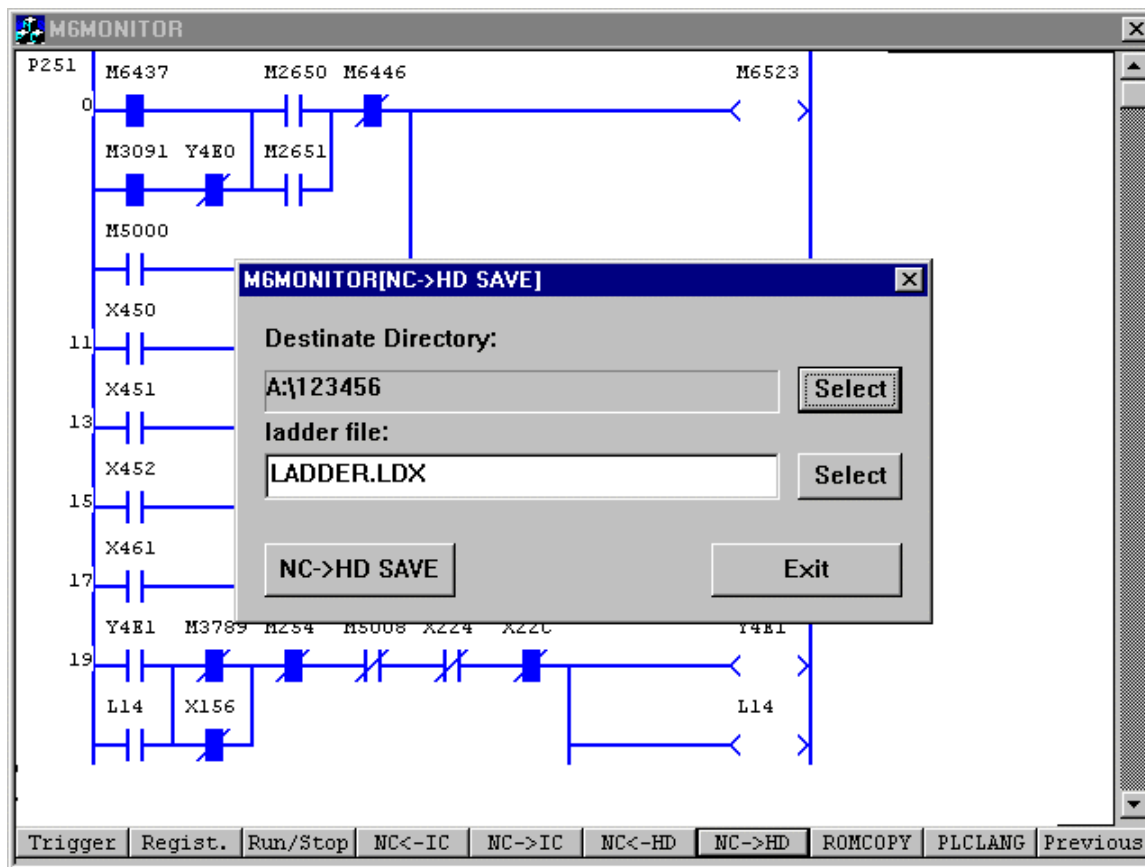


14. After making directory, double click on directory name, then click on Select





15. Directory name will appear in the upper left. If shows A:\123456 or whatever directory is named, press “Select”.
- 16) Select NC->HD SAVE button with Mouse.
The NC->HD SAVE button’s lettering will disappear and say “Complete” when done.



It will download

the ladder.idx(plc ladder) and some *.lpc files. The *.lpc files are the menu and alarm files and will probably be men**.lpc for English, mjp**.lpc for Japanese, mfr**.lpc for French. F.Y.I. these files are on hard drive under the c:\M6_ymw\Mplc for machining centers, c:\M6_ymw\Tplc.

17) When says "Complete" its done, select the EXIT button.

18) To get out of ladder monitor, press the "PREVIOUS" menu key. Then select "FILE" and "EXIT" menu buttons.

M640 PLC Update Floppy.doc

Procedure to update the PLC ladder files by Floppy Disk.

- 1) When update the plc to another machine, please have your serviceman SAVE the existing ladder (ladder.ldx file) and the accompanying *.lpc files, and *.bmp files

(See M640_plc_saving_floppy.doc for explanation).

**Note: O84 bit 0 must be a 0 on M640T controls to allow load.
K96 bit 5 must be a 0 on M640M controls to allow load.**

It is possible to update by either IC Flash Memory Card or Floppy Diskette or Hard Drive.

The update will consist of 1 file with an .LDX extension. There may or may not be other file(s) with a .LPC extension. The *.LDX is the ladder, the *.LPC is the menu/alarm data. (See M640_plc_explanation.doc for more explanation)

2) RENAME the existing *.LPC files in c:\M6y_ymw\Mplc for M640M or c:\M6y_ymw\Tplc for M640T or M640MT
To do this, you must go into Windows Explorer.
My suggestion for renaming would be same first part and change the extension to *.sav

3) Now that everything is backed up, insert the floppy diskette with the update on it. Go to Windows Explorer and create a folder with same version of plc you are updating in the c:\ladder folder. For example, if you were sent files 342KBT1.ldx, 342B3.lpc, and many *.bmp files, create 342KBT1 folder under it. The results will be as shown in figure 1. when done:

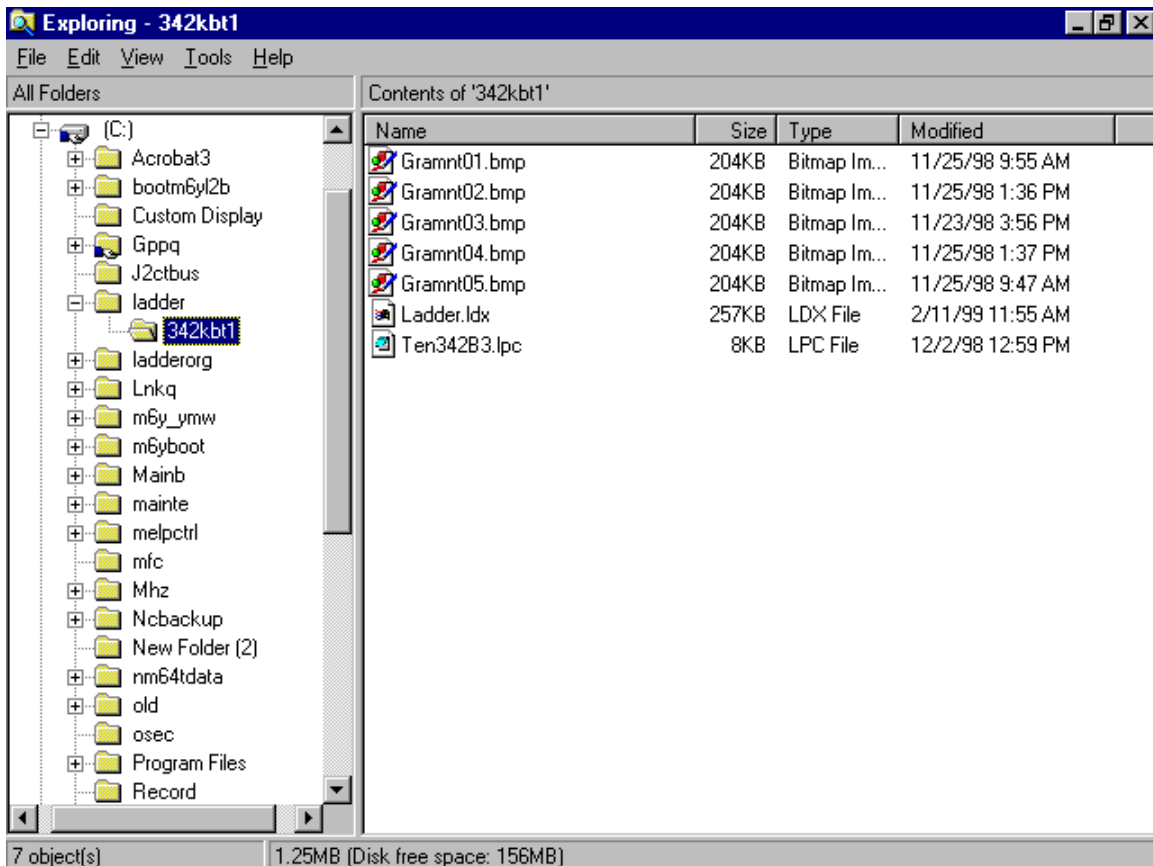


Figure 1.

You may not see a LADDER.LDX as shown in this example. It can be any name with the *.ldx extension.

The provider of the ladder should give you this information:

The directory for this update is: A:

The filename for this update is: ladder.ldx

The above shows that you have the ladder.ldx file in the A:\ (root) folder chosen to do the update.

4) If included, copy the new *.lpc and *.bmp files into the C:\M6y_ymc\Tplc (lathe) or C:\M6y_ymw (machining center)

5) Go to the NC screens now, and Press “Diagnos” menu key.

- 6) Press "Version" menu key.
- 7) Press "Ladder Monitor" menu key.
- 8) Select "Tool" menu key.
- 9) Press "Run/Stop" and double-click the "STOP" button.
- 10) Click on "OK" and then on "CLOSE".
- 11) Select "NC <- HD" menu key.
- 12) Press top "SELECT" to get correct directory. Using the example, it would be 342KBT1.
- 13) Select 342KBT1 and press "SELECT" when done. See figure 2.

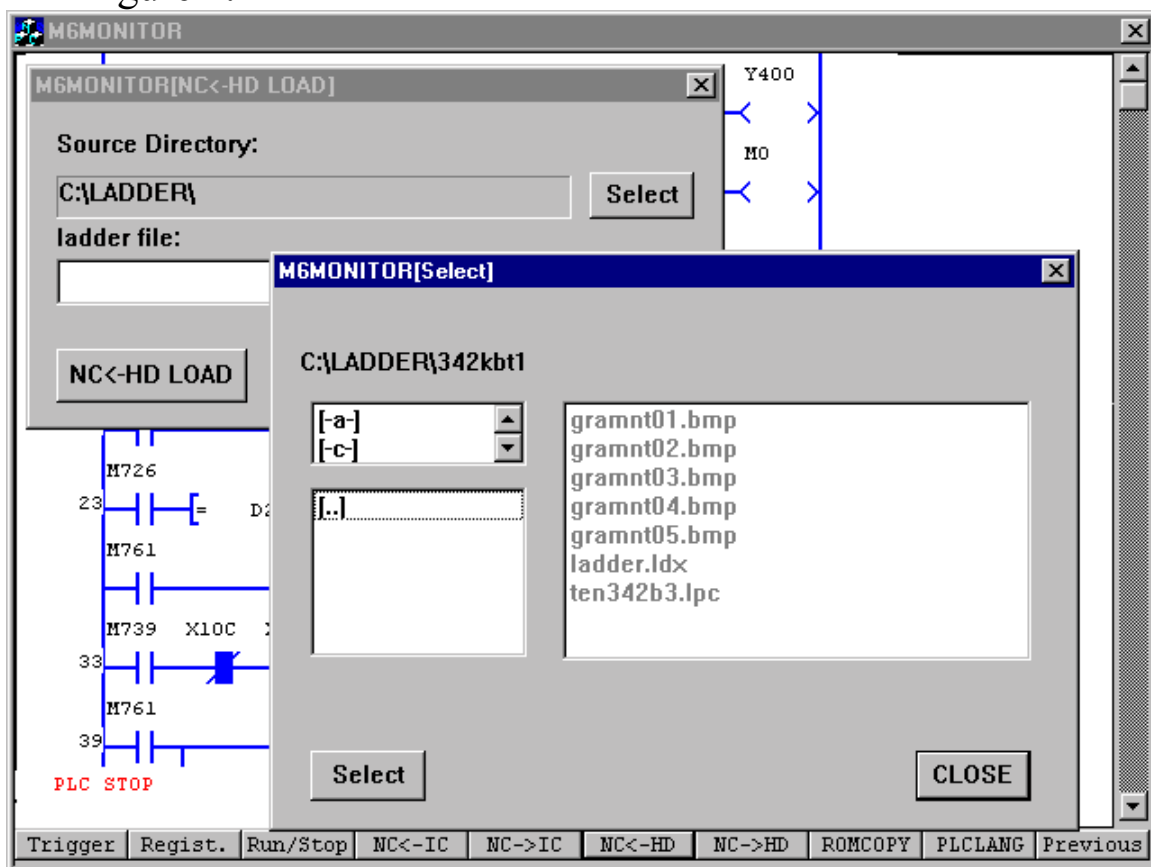


figure 2.

- 14) Press the NC<- HD LOAD button and will see display change slightly as seen on next page.
- While loading, the NC <- HD LOAD button fades and when done,

a dialog box will say Complete. This will take about 1 to 2 minutes. If it asks you if you wish to overwrite some *.lpc files, just say Yes.

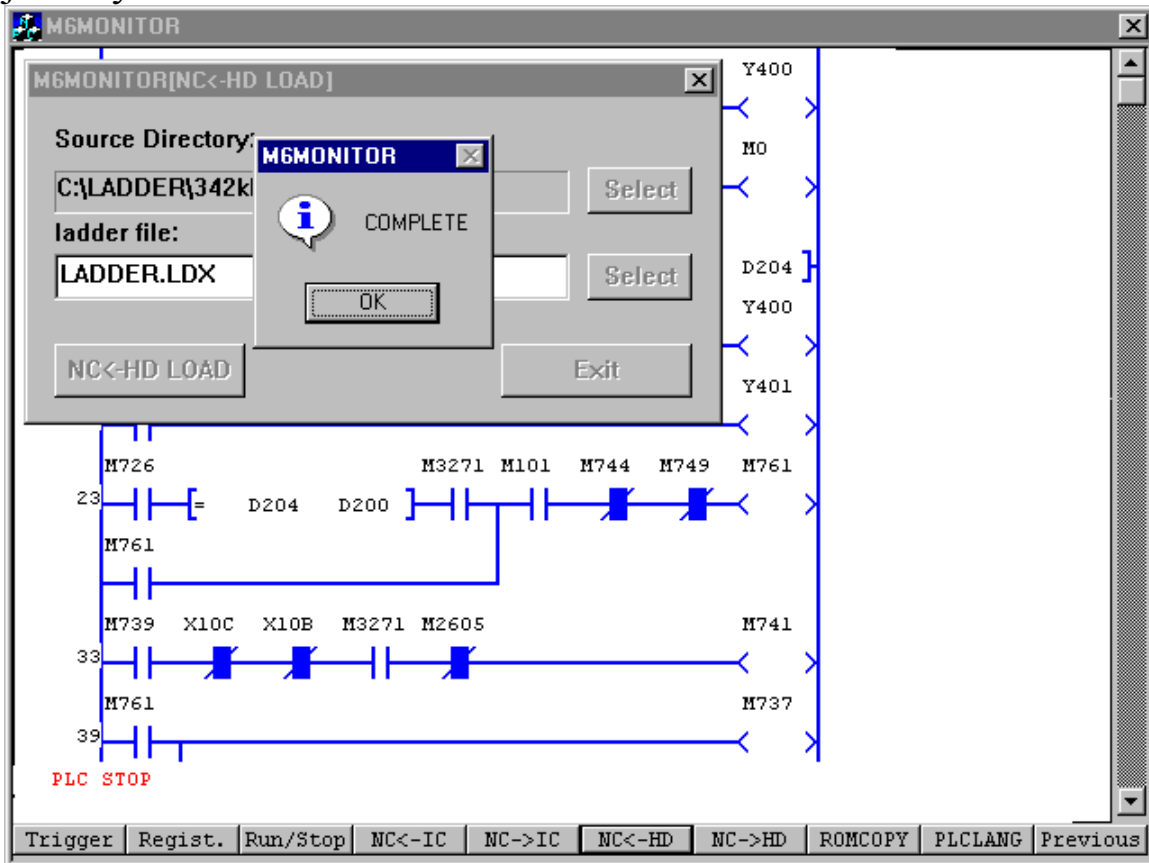


figure 3.

It will upload the ladder.ldx(plc ladder) and any *.lpc files if included in same directory on the card. The *.lpc files are the menu and alarm files and will probably be men**.lpc for English, mjp**.lpc for Japanese, mfr**.lpc for French. F.Y.I. these files will be saved to hard drive under c:\M6_ymw\Mplc for machining centers, c:\M6_ymw\Tplc. They are read on power up and loaded. The actual ladder is stored on the Flash Rom area of the HR113 board of the CNC.

15) When done, select the EXIT button.

16) Get out of ladder monitor, press the "PREVIOUS" menu key. Then select "FILE" and "EXIT" menu buttons.












17) Once out of ladders, power off control.

18) Power on control, check version display for correct plc.

M640 PLC LPC File Explanation.doc

When a PLC is released from Ky. Production, there is an Ecn in Excel format, along with ladder.ldx, and optionally new bitmap and lpc file. Japan engineering does not do this.

Next page shows a typical Ecn release. This one is for QT30N PLC version 342KBT1 whereas the graphic maintenance files were just added. If look at 342KBT1.zip it contains these files:

	342KBT1.doc	02/11/99 14:25	2,459,136	90%	253,613
	342kbt1.gpg	02/11/99 10:47	61,056	61%	24,069
	ECN756.xls	02/12/99 08:12	21,504	75%	5,339
	Gramnt01.bmp	11/25/98 09:55	208,374	81%	39,087
	Gramnt02.bmp	11/25/98 13:36	208,374	74%	54,992
	Gramnt03.bmp	11/23/98 15:56	208,374	74%	54,193
	Gramnt04.bmp	11/25/98 13:37	208,374	75%	51,903
	Gramnt05.bmp	11/25/98 09:47	208,374	85%	30,418
	Ladder.ldx	02/11/99 11:55	262,160	90%	24,955
	qtn30m640plc.xls	02/11/99 13:46	38,912	80%	7,780
	Ten342B3.lpc	12/02/98 12:59	7,200	75%	1,780

	MACHINE TYPE :	QTN-30/30HP,QT-25L/35XS	DATE : 2/11/99
	START PERIOD :	IMMEDIATELY	FROM : ERIC CRUMP
1	CATEGORY	<input checked="" type="checkbox"/> SOFTWARE <input type="checkbox"/> PARAMETER <input type="checkbox"/> OTHER	<input type="checkbox"/> PARTS <input type="checkbox"/> MANUAL
	RE :	PLC UPDATE (342KBT0 TO 342KBT1)	
1	The PLC for the Large QT's has been updated from 342KBT0 to 342KBT1. The reasons for the update are as follows:		
1	1) The spindle jog operation was modified. The spindle jog menu key has to be pressed along with the MF1 key in order for the spindle to jog. When the two buttons are released, the spindle is back to normal operation.		
1	2) M-Codes were added to start and stop the chip conveyor.		
1	a. M118 - The chip conveyor runs forward		
	b. M119 - The chip conveyor stops		
1	3) Logic was added to allow the chip conveyor to be started and stopped by a push button on the operator panel. R64 bit 7 has to be set to a 1 in order for the push button to become active.		
1	(NOTE: This modification to add a push button switch will only be made at customer's request until Mitsubishi starts sending the sub-operating panel with the push button already on.)		
1	4) Logic was added so that the Auto Door will not manually open or close unless the MF1 key is also held down.		
1	5) The turret can now be operated manually in step mode or continuous.		
1	a. R63 bit 2 has to be set to a 0 for the turret to operate in step mode.		
1	b. R63 bit 2 has to be set to a 1 for the turret to operate in continuous mode.		
	6) Logic modified so that the Low Speed menu key for the inverter chip conveyor is highlighted when the machine powers up.		

Below shows the new lpc file: Ten342B2.lpc

- 1) First part is alarm 300 to 400 definition.
- 2) Second second is Menu definition.
- 3) Last part is the Graphic Maintenance file definition.

; #Ten342B2.lpc

```

;#al_max      1632
;#al_char     32
;#al_use      50
;#al_start
[Alarm]
350,1,OPERATING SWITCH FAULT
351,1,SPINDLE CONTACTOR FAULT
352,1,POWER SUPPLY CONTACTOR FAULT
353,1,DOOR LOCK SWITCH FAULT
354,1,AJC BODY REVERSE ALM
355,1,LOCK PIN UP ALM
356,1,LOCK PIN DOWN ALM
357,1,SHIFT UP ALM
358,1,SHIFT DOWN ALM
359,1,AJC ORIENT ALM
360,1,TIME OVER ALM
361,1,LOCK PIN NOT UP SIDE
362,1,LOCK PIN NOT DOWN SIDE
363,1,BODY NOT FORWARD SIDE
364,1,BODY NOT REVERSE SIDE
365,1,SHIFT NOT UP SIDE
366,1,SHIFT NOT DOWN SIDE
367,1,DRUM NOT INDEX POSITION
368,1,SPINDLE NOT STOP
369,1,DRUM MOTOR THERMAL TRIP
370,1,DRUM HAVE JAW
371,1,TURRET SERVO ALARM
372,1, AUTO DOOR INVALID POSITION
373,1,DEPRESS AUTO DOOR OPEN PB
374,1,DEPRESS AUTO DOOR CLOSE PB
375,1,WAYLUBE LOW LEVEL ALARM
376,1,CONVEYOR AUTO OVERLOAD SEQUENCE
377,1,AL377
378,1,CONVEYOR OVERLOAD "OFF"
379,1,AL379
380,1,AL380
381,1,AL381
382,1,AL382
383,1,AL383
384,1,AL384
385,1,AL385
386,1,AL386
387,1,AL387
388,1,AL388
389,1,AL389
390,1,AL390
391,1,AL391
392,1,AL392
393,1,AL393
394,1,AL394
395,1,AL395
396,1,AL396
397,1,AL397
398,1,AL398
399,1,AL399
;
;#al_end
;#op_max
;#op_char     60
;#op_use      36

```

```

;#op_start
;
[Menu]
; 123456781234567812345678
;      |      |
;      |      |
; 0,
; 1,
; 2,
;
;menu no.300 (0-9)
;123456781234567812345678
;      |      |
; 0,      OPTION
; 1,      SPINDLE
; 2,
; 3,      CHUCK
; 4,      AXIS
; 5,      MAINTENANCE
; 6,
; 7,
; 8,
; 9,
;menu no.301 (10-19)
; 123456781234567812345678
;      |      |
; 10,     PARTS-C EXTEND
; 11,     PARTS-C RETRACT
; 12,     BAR FEEDER
; 13,     CONV FWD
; 14,     CONV REV
; 15,     CONV STOP
; 16,     CONV LOW SP
; 17,     CONV HIGH SP
; 18,
; 19,     AUTO PWR OFF
;menu no.302 (20-29)
; 123456781234567812345678
;      |      |
; 20,
; 21,
; 22,
; 23,
; 24,
; 25,
; 26,
; 27,
; 28,
; 29,
;menu no.303 (30-39)
; 123456781234567812345678
;      |      |
; 30,     SP. ORIENT
; 31,     CHUCK AIRBLAST
; 32,
; 33,
; 34,
; 35,
; 36,
; 37,

```

```

38,
39,
;menu no.304 (40-49)
; 123456781234567812345678
;      |      |
40,
41,
42,
43,
44,
45,
46,
47,
48,
49,
;menu no.305 (50-59)
; 123456781234567812345678
;      |      |
50,
51,
52,
53,
54,
55,
56,
57,
58,
59,
;menu no.306 (60-69)
; 123456781234567812345678
;      |      |
60,
61,
62,
63,
64,
65,
66,
67,
68,
69,
;menu no.307 (70-79)
; 123456781234567812345678
;      |      |
70,      EXT.  CHUCK
71,      INT.  CHUCK
72,
73,
74,
75,
76,
77,
78,
79,
;menu no.308 (80-89)
; 123456781234567812345678
;      |      |
80,
81,
82,

```

```

83,
84,
85,
86,
87,
88,
89,
;menu no.309 (90-99)
; 123456781234567812345678
;      |      |
90,
91,      TAILBODY UNCLAMP
92,
93,
94,
95,
96,
97,
98,
99,
;menu no.310 (100-109)
; 123456781234567812345678
;      |      |
100,      COOLANT  AUTO
101,      COOLANT  MANUAL
102,
103,
104,
105,
106,
107,
108,
109,
;menu no.311 (110-119)
; 123456781234567812345678
;      |      |
110,
111,
112,
113,
114,
115,
116,
117,
118,
119,
;
; R8110
[Mainte01]
00,190,035,WORK LIGHT
01,000,140,SPDL. POS. ENCODR.
02,000,270,FOOT PEDAL SWITCH
03,220,280,TOOLEYE EXT./RET.
04,235,245,TOOLEYE SENSOR
05,500,277,CMT PANEL
06,360,260,LCD PANEL
07,330,015,DOOR INTRLK.
;R8111
[Mainte02]
00,210,300,Z-AXIS MOTOR

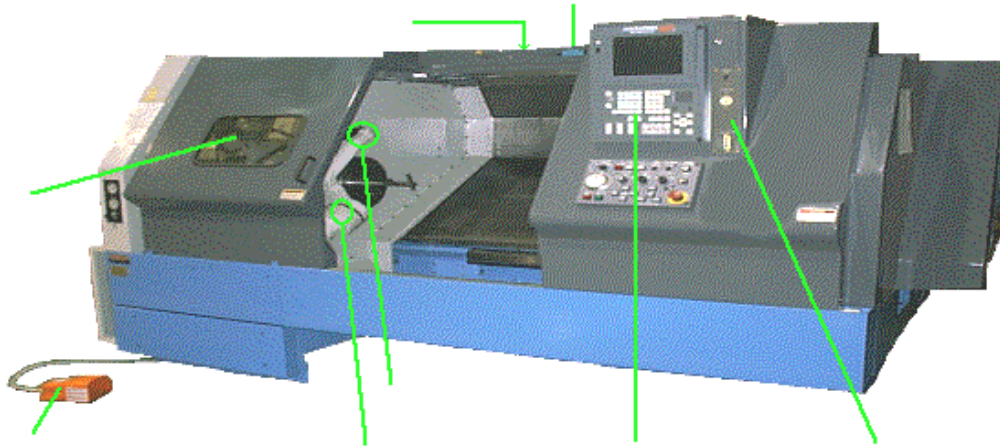
```

```

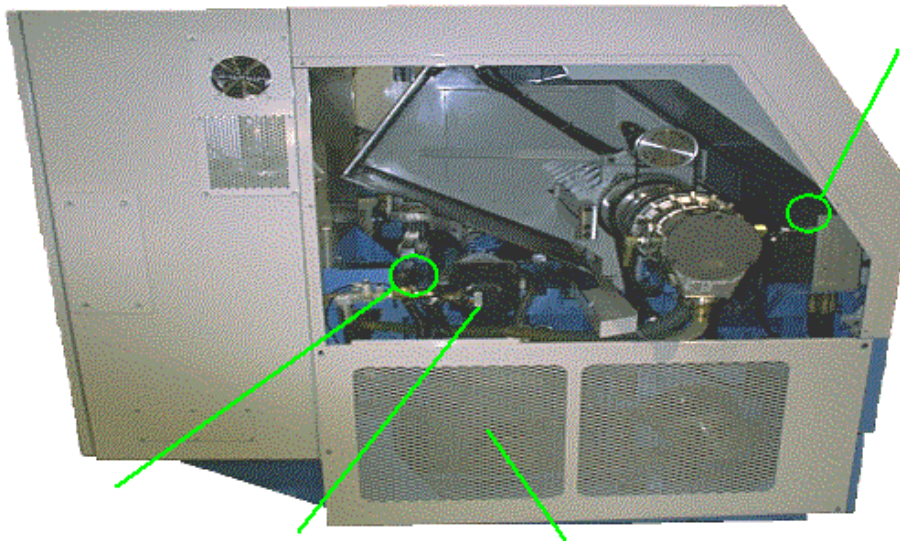
01,480,020,CHUCK CL/UCL SOL.
02,355,290,SPINDLE MOTOR
03,090,270,AIR SOLENOID
;R8112
[Mainte03]
00,040,237,LUBE TANK MOTOR
01,000,087,LUBE PRESS. SW.
02,300,030,TURRET ASSEMBLY
03,140,270,LUBE FLOAT SW.
04,365,275,HYDRAULIC MOTOR
05,500,223,PRESSURE SW.
06,190,300,TRANSFORMER
;R8113
[Mainte04]
00,250,010,TURRET HYDRAULIC MOTOR
01,450,100,CLAMP PROX. SWITCH
02,160,030,X-AXIS MOTOR
03,120,290,X-AXIS ZERO POSITION
04,440,042,TURRET CL/UCL SOL.
05,440,187,TURRET FWD/REV SOL.
;R8114
[Mainte05]
00,450,240,TAIL SLEEVE FWD/REV PROX.
01,100,050,TAIL SLEEVE
02,475,118,TAIL BODY MOTOR
03,270,030,TAIL BODY FWD. SW.
04,070,255,TAIL BODY CL/UCL SOL.
05,450,050,TAIL SLEEVE FWD/REV SOL.
06,415,000,TAIL SLEEVE PRESSURE
;R8115
[Mainte06]
;R8116
[Mainte07]
;R8117
[Mainte08]

```

Lastly, the bitmap files are included and are numbered Gramnt01.bmp thru Gramnt05.bmp

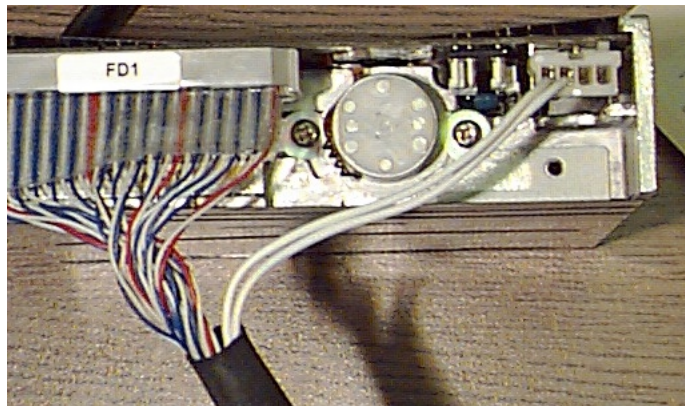


This is the first Graphic maintenance file. Gramnt01.bmp

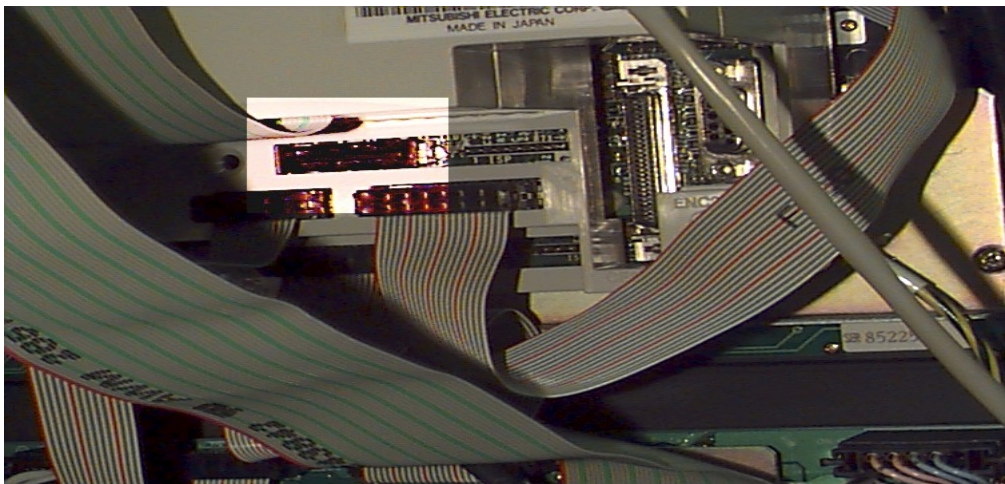


This is 2nd graphic maintenance file. Gramnt02.bmp

M640 Floppy Installation Instruction.doc



The cable should be attached to the floppy side already. If this cable is not connected, refer to this picture for cable placement.



The other end of the floppy cable is labeled CFD. This cable is placed in the slot marked CFD on the rear control panel. The highlighted area represents the CFD slot.

- Power off control
- Plug CFD connector into CFD slot
- Power on control

IF floppy does not respond, check floppy LED. If this is on and no disk is in floppy, check ribbon cable connection. (Possible that cable is plugged in backwards.)

M640 Hard Disk Replacement Procedure.doc updated 10/29/1999 adding new B-version files for alarm navigation and lathe navigation files.

1. Backup saved data following the M640_Data_Save_Procedure. (This is done as a precaution just in case some data is lost.) If this is to replace a damaged drive. See Appendix A and B. You can recover customer's program by going to directories listed below.
2. Backup the following data, using Windows explorer, to a floppy disk or to an IC memory card connected to one of the two PCMCIA slots located on the back of the control. (You cannot use the front IC memory card slot.) You may either "drag and drop" or "cut and paste" each file from the hard drive to your target device.

Below chart show the data and how directory(s) look when in Dos mode(Dos view).

DATA TYPE	FOLDER PATH NAME
Machining programs-Lathe -M/C	C:\T_Machine programs (C:\T_MACH~1,dos view) C:\MC_Machine Programs (C:\MC_MAC~1,dos view)
Programs backed up on hard drive-Lathe M/C	C:\T_Backup (C:\T_BACKUP,dos view) C:\MC_Backup (C:\MC_BAC~1,dos view)
Programs for HDD running Lathe M/C	C:\T_Direct mode programs (C:\T_DIRE~1, dos view) C:\MC_Direct mode programs(C:\MC_DIR~1, dos view)
Sampling data – Lathe - M/C	C:\T_sdg and all sub-directories C:\MC_sdg and all sub-directories
MR-J2-CT parameter data	C:\J2ctbus*.prm Note: This is only backup data. Actual parameters are stored in the MR-J2 drive.
Menu files(*.Lpc,*.bmp,*.alm) – Lathe - M/C	C:\m6y_ymw\Tplc C:\m6y_ymw\Mplc
PLC macros on some lathes	C:\T_PLC program(C:\T_PLCP~1, dos view)
Navigation files on lathe if B-version	C:\nm64tdata\navipara.txt
System macros on some lathes	C:\T_System macros(C:\T_SYST~1, dos view)

3. Back up the above programs and data. Depending on the Machine/option configuration, some items may not be required. If hard drive information is unrecoverable, then request the Menu LGP files from your regional office. If power on without these files, machine menus will be missing. However, check ladder version and inform your office of what ladder and they can send the appropriate version.
4. Power down control. Turn off main breaker.
5. Replace the hard drive. Take special care to make sure cable is plugged in correctly. Place hand on cable where plugged into hard drive when power on. If gets real hot if plugged in wrong. Should see "Starting Win95" within 10 to 15 seconds, if not, power off and recheck cable.
6. Turn on the main breaker and the NC power.

7. Using Windows explorer, reload the backed up (in step 2) data. Power off/on.

Appendix A

We have had some Hard Drive failures on Fusion controls. The most reported failure is that customer would power off at night and restart machine in the morning. At that point, the control will come up with the following alert:

The following file is missing or
corrupted c:\windows\mimem.sys
Windows expanded memory driver
Version 4.95
Copyright 1988-1995 Microsoft Corp.

EMM386 Not Installed - XMS
Manager Not Present

C:\

If this happens, replace the hard drive, in dos mode you can save the information shown above so can input on new hard drive. Most important is the *.lpc, *.bmp, and *.alm file in C:\m6y_ymw\tpic or mpic area. If have a lathe with B-version or greater, there may be a navipara.txt in **C:\nm64tdata**

If this happens, please order a replacement hard drive.

You will need the OEM number which is on the Certificate of Authenticity.

Also, what is version on machine. You will have to go by past records, most importantly is machine control type and machine. And fill out Appendix B sheet.

Appendix-B

Fill out this form when replacing drive and send back with failed drive:

MAZATROL FUSION 640 HARD DRIVE UPDATE REPLACEMENT REPORT

***THIS DATA IS REQUIRED TO PROPERLY TRACK ***

***HARD DRIVE UPDATES IN THE FIELD ***

Customer name:	
Customer address:	
Contact name:	
NC serial # :	
NC control unit type: MU514 / MU515 / MU515-12	
Windows product ID # :	
New hard drive serial number:	
Old hard drive serial number:	
Main A s/w version:	
Main B s/w version:	
Cabinet # :	
Machine serial # :	
Machine type:	
Installation date:	
U.S. made machine: Y / N	
Your name:	Date:
Region:	Phone #:

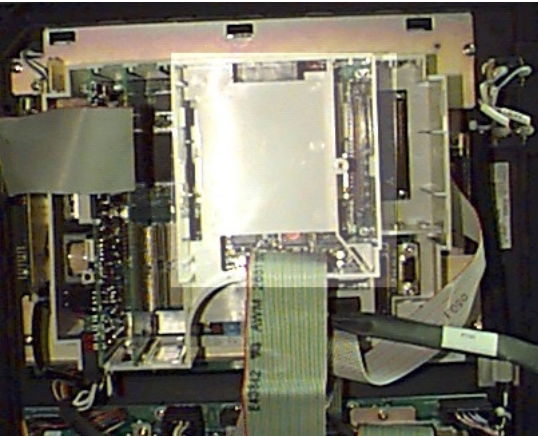
*** BOTH MAZAK AND MITSUBISHI NEED THIS *
* INFORMATION FOR EACH ***

*** HARD DRIVE REPLACEMENT ***

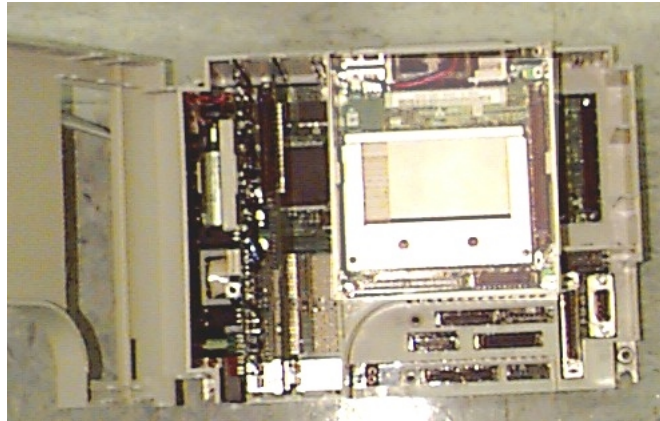
PLEASE RETURN THIS DOCUMENT WITH THE OLD HARD DRIVE

PCMCIA CARD SLOT INSTALLATION

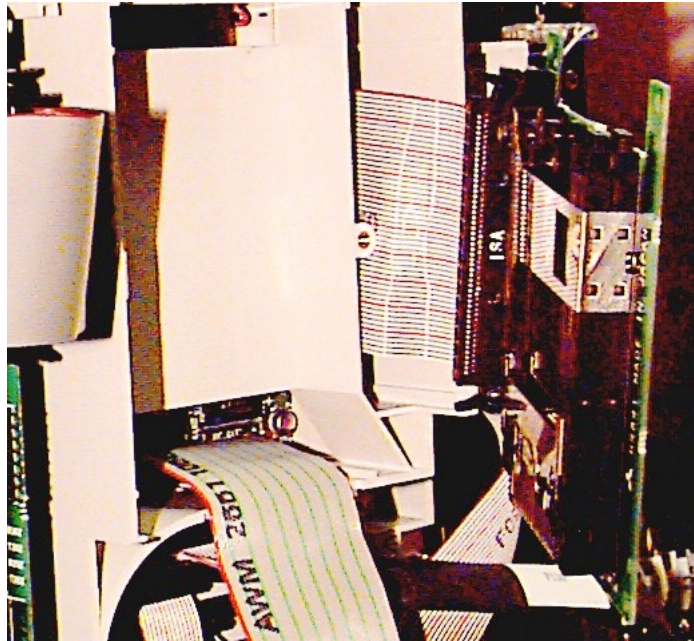
MU514



MU515

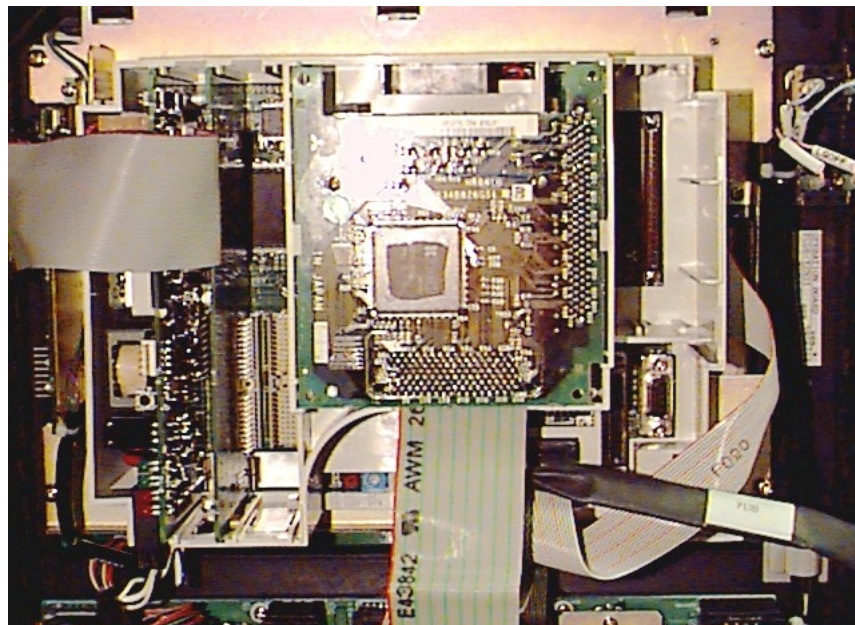


Shown above are the MU514 (original model control) and the MU515 (new model control). The visible difference between the two is the plastic cover over the processor. The hardware locations are the same for both. Next page.



To install the PCMCIA slot card simply:

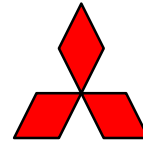
- 1) Power down the control
- 2) Connect ribbon cable to the right of plastic cover on the MU514 or the processor on the MU515. (MU514 shown)



Once you have made the connection between the control and the card slot PCB via ribbon cable, simply snap the PCB into the plastic housing as shown above.

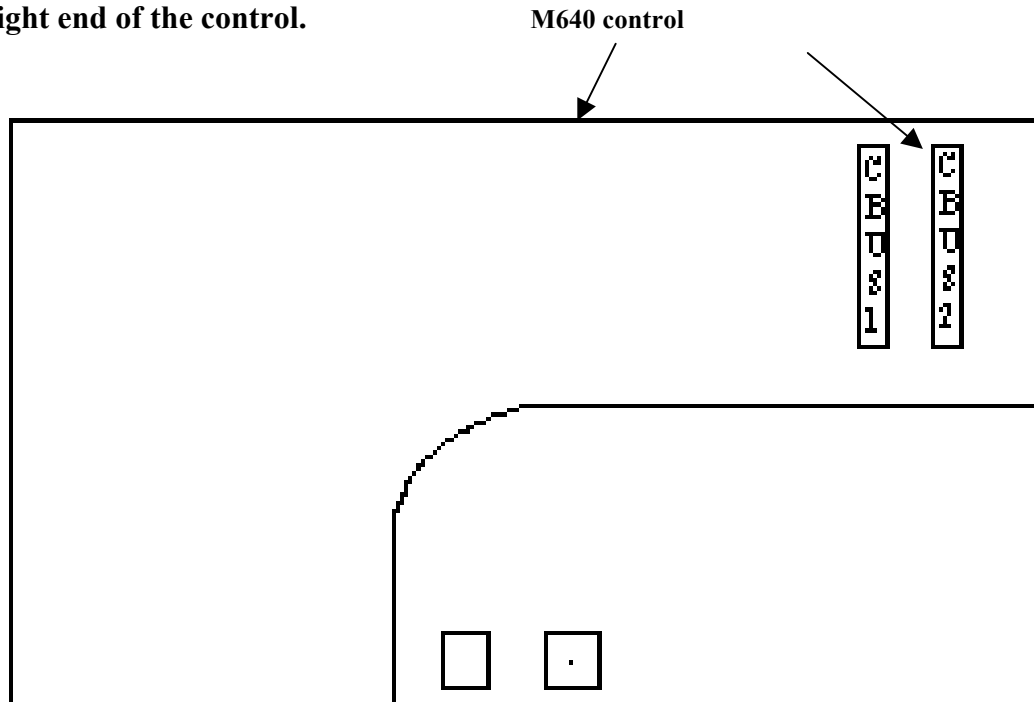


SETTING A SOFTWARE OPTION ON THE MAZATROL FUSION 640



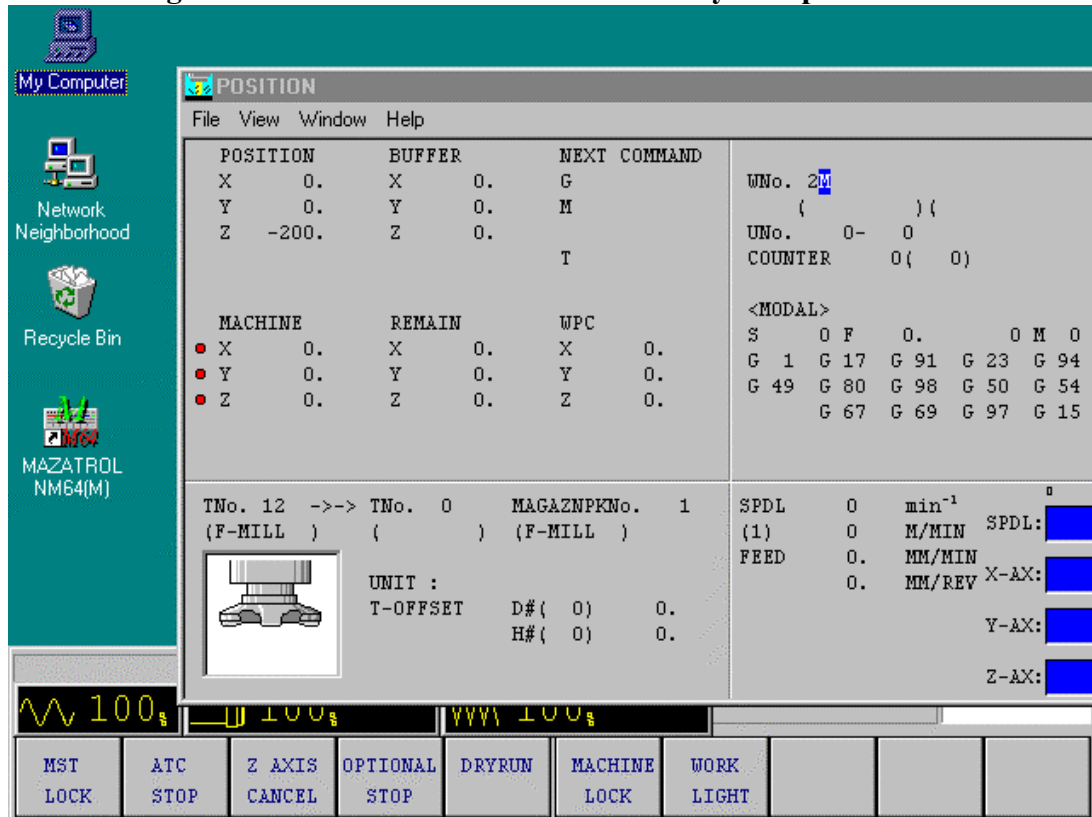
M640 Option Installation Procedure.doc

1. Power down the control and open the operator panel so you can access the back of the control.
2. Open the control by pulling on the door tabs on the right side of the plastic case.
3. Take the QX812 option cassette and plug into the CBUS2 slot located at the far right end of the control.

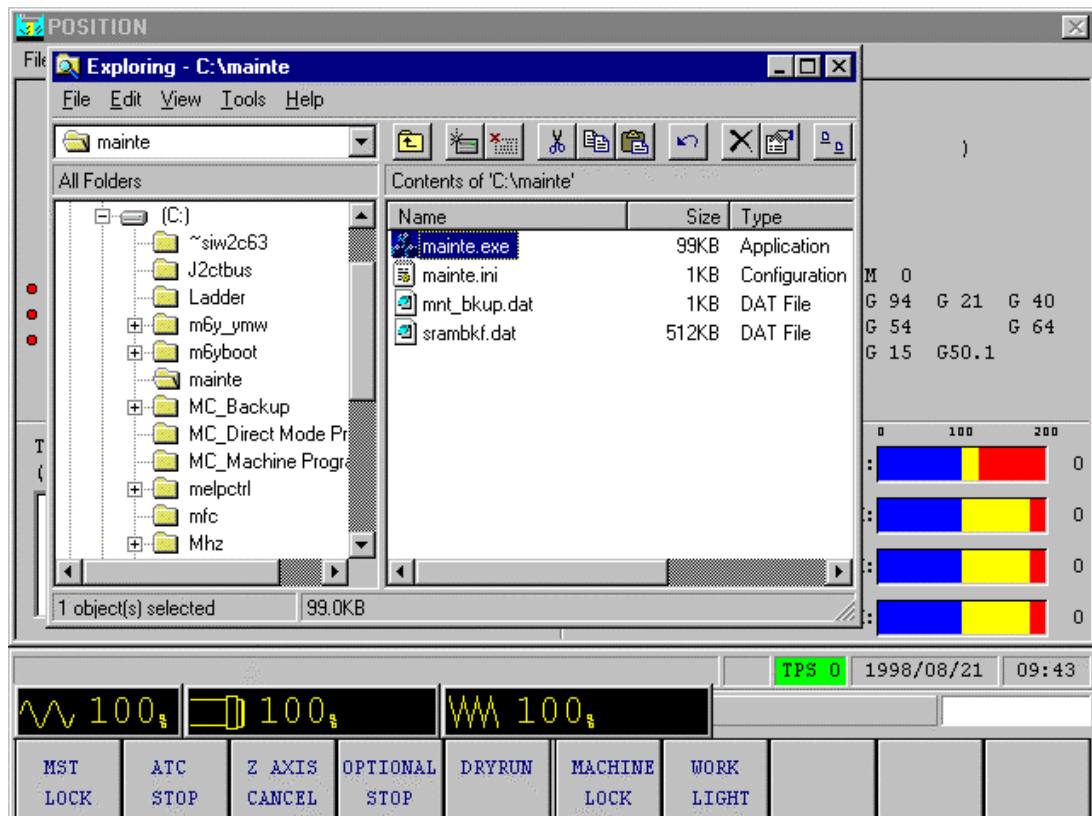


4. Power on the CNC.
5. Start the "MAINTE.EXE" file. Follow below to find this file.

- Click on the blue top of the position screen and move it to the right as shown below. Double click on “My Computer”.

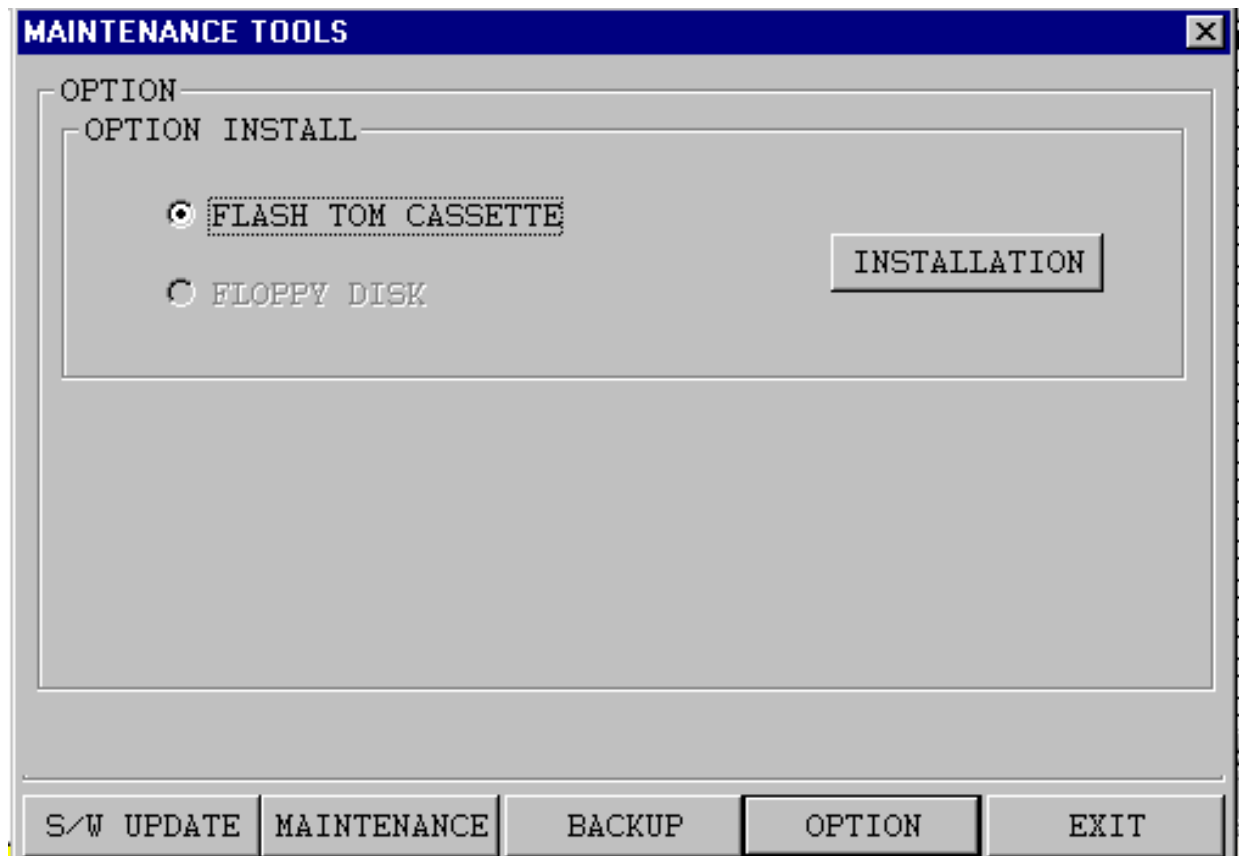


- Double click on “C” hard drive and look for the “mainte” folder.



- Double click this folder and double click on the “mainte.exe” file.

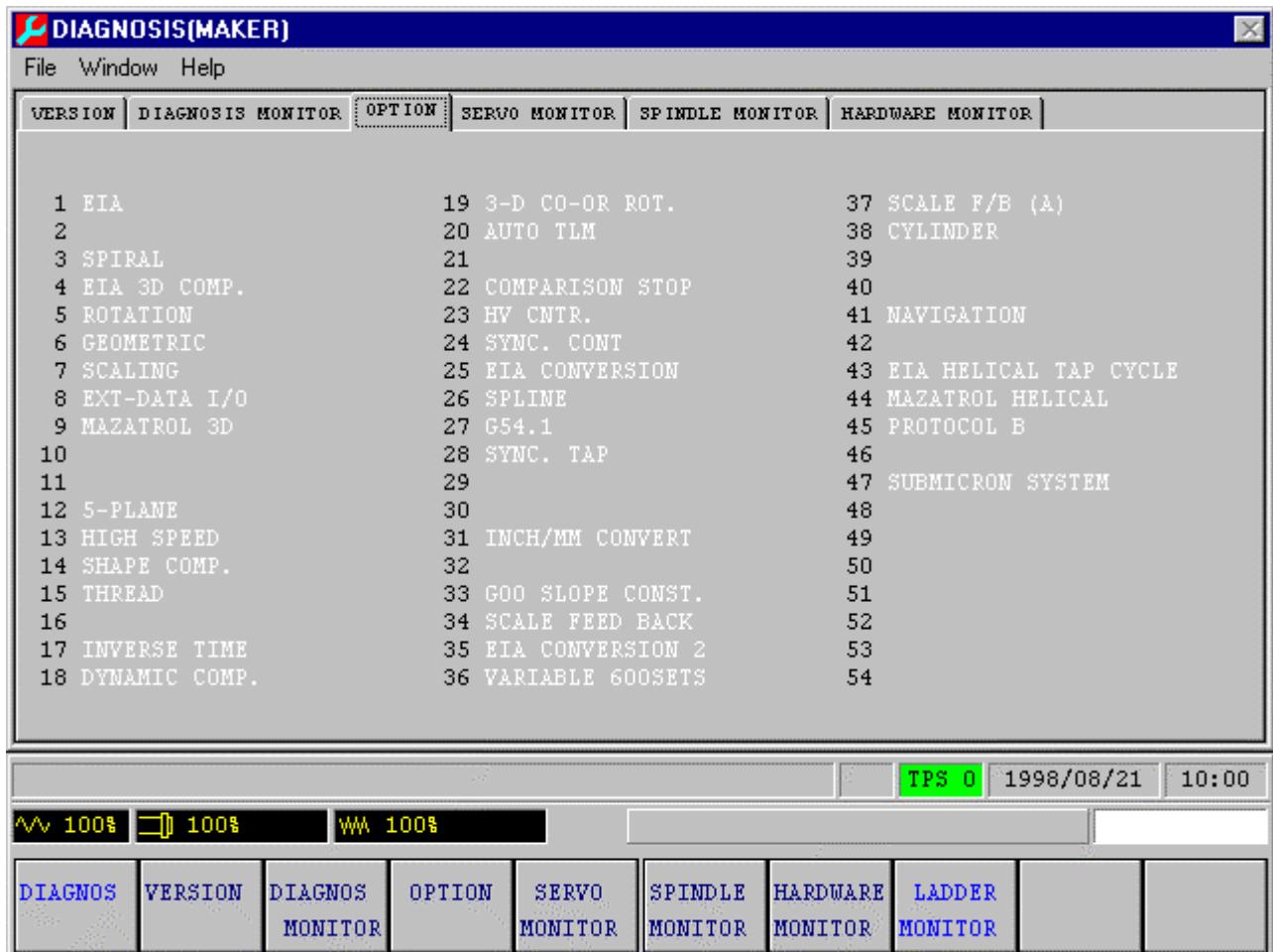
6. Select “option menu”



7. Select “Installation”. Wait for the “Option loaded with success” window, click “ok”, then select “Exit”

8. Power off then on→ option becomes effective. Set any option parameters if necessary.

9. Confirm option installation by verifying the particular option is highlighted in black on the option page.



M640 SanDisk Explanation.doc

The M640 front slot uses Memory Cards for uploading and downloading data. Mitsubishi is being very insistent on what type of cards to use. If customer is wanting to run from the IC card, the CNC option "IC Memory Card Running" must be purchased from Mitsubishi. Mazak sales calls this option IC Memory Card Operation. IC Memory Card Interface is standard and allows you to upload/download data to IC card. IC Memory Card Operation option is only available for the M640M(machining center) control. Not available for M640T or M640MT, or M640TE. This option is around \$4500.

Also, Mitsubishi insists on what type of Ethernet card for the 2-slot PCMCIA rack. See below. This information was in the manuals when we had the preliminary M640 class this June. See page 22 of BNP-B3699-158C. The lan card is EtherLink III 3C589D.

I sent the following message by Email on 11/2/98.

When using the San Disk Memory Cards. Mitsubishi states must use the "Type 2 ATA standard 5 volt type".

Any other types is not acceptable. Any other type must be approved in writing by Mitsubishi.

Also, please note that they only recommend one type of Ethernet card and mfr. Etherlink III 3C589D manufactured by 3COM.

As of March, 1999, with new HR251 we can now use a flash type San Disk which is about 3.3 volt.

Older version is a HR251B version. Older cards can be upgraded at a cost of about 150 dollars.

M640 Option Overload Detect

The M640T and MT has the overload detect feature the same as Tplus control.

- 1) However, there are some differences in the setting of the O-parameter.

Set O61 to AscII value, not hex.

For example, if using A as the Misc. code, input 41 for O61 (Not 65 like on Tplus).

If using "B" as the Misc. code, input 42 for O61.

Note: If there is a B-code already used on machine like SQT or Igx200 always use "A" setting.

- 2.) Set R53 bit 4. Verify this is correct R-parameters, but this has been used universally on all lathes so far.
- 3.) Save these parameters to the Flash Rom. You must save to Flash Rom area to become effective.

The screenshot displays the M640T/MT control interface with the following sections:

- File Window Help** menu bar.
- Parameters Table:**

UNo.	MAT	OD-MAX	ID-MIN	LENGTH	RPM	FIN-X	FIN-Z	WORK	FACE
0	CBN STL	3.	0.	10.	800	0.01	0.01		

UNo.	UNIT	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	#10	#11	#12
1	M	378			100								
2	M	376			90	377		10		379			1
3	M	371			201					374			

UNo.	UNIT	#	CPT-X	CPT-Z	RV	FV	R-FEED	R-DEP.	R-TOOL	F-TOOL
4	BAR OUT	0	3.	0.	492	642	0.017	0.19	GNL OUT A	GNL OUT A

SEQ	SHP	S-CNR	SPT-X	SPT-Z	FPT-X	FPT-Z	F-CNR/\$	RADIUS/ch.	RGH
1	LIN		↑	↑	2.75	8.		↑	▼▼▼ 5

UNo.	UNIT	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	#10	#11	#12
5	M	370											

UNo.	UNIT	COUNTER	RETURN	WK.No.	CONT.	NUM.	SHIFT
6	END	0	1		0	0	

Status Bar: SP1 TPS 0 1999/09/13 10:26

Controls: ^v 100% [] 100% [] 100%

Buttons: WORK No., FIND, PROGRAM, HELP, TPC, LAYOUT, TOOL, PROGRAM

Footer: Start MAZATROL : 69

- 4.) Below is a sample program used on Igx200sy.

The following is an explanation of program. See manual number 712S064, Op. Manual for Overload Detector for more detail.

M378 100 is Peak Value of current. Set at 100 percent usually.

M376 90 Overload Detect amount

M377 10 Overload Detect dwell amount

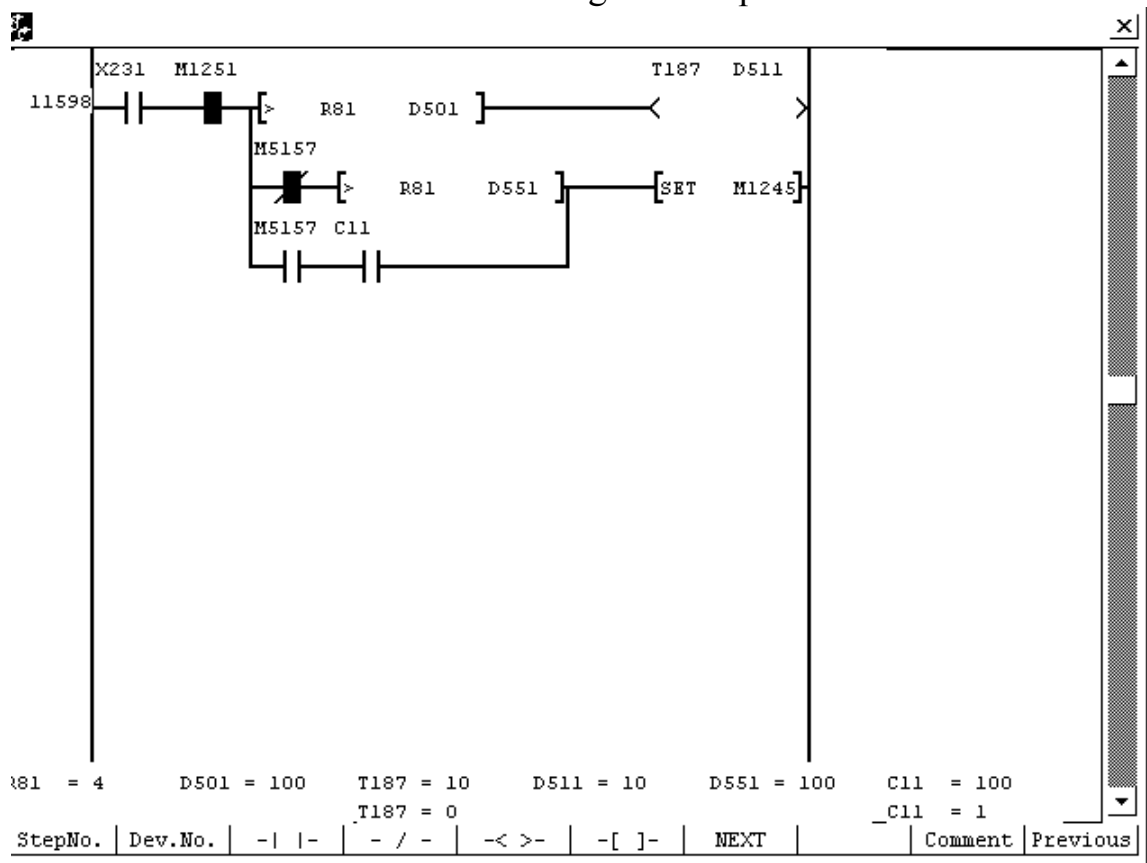
M379 1 Data is entered into Table 1.

M371 201 Z-axis check Table 1 value

M374 When overload detected, NC feedhold on.
Spindle and Mill spindle not stopped.

An easy test is to put a piece of wood between chuck and turret and run at low feedrate. It should alarm out on Z axis slightly over 90% load.

Below illustrates the ladder handling of this option.



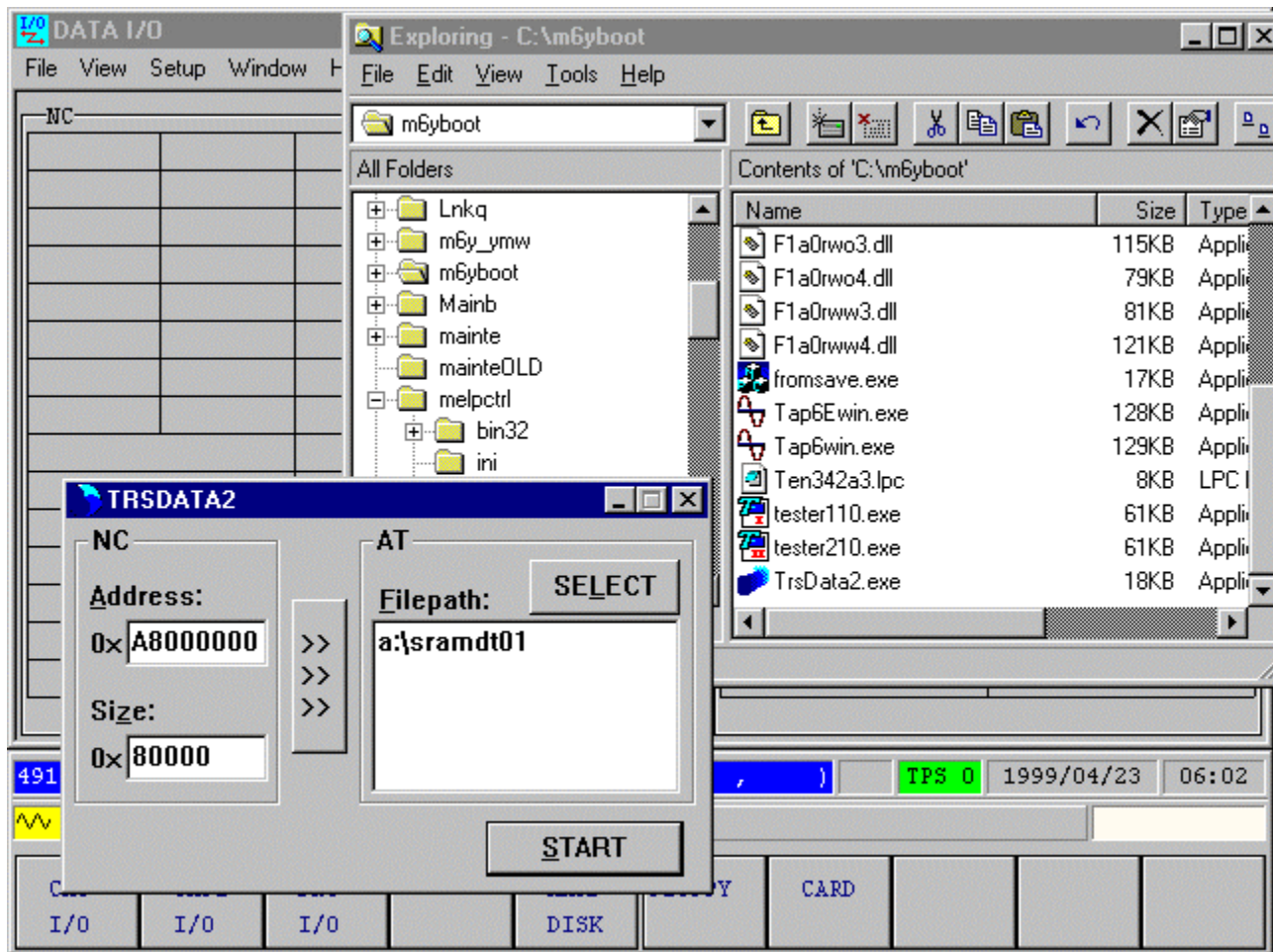
R81 is actual load

D501 is M376(But was changed to 100 at time this ladder was checked.

T187 and D511 is M377 value of 10(1 second).

D551 is M378 value of 100.

M640 Data Save SRAM Procedure.doc



To capture Data to SRAM:

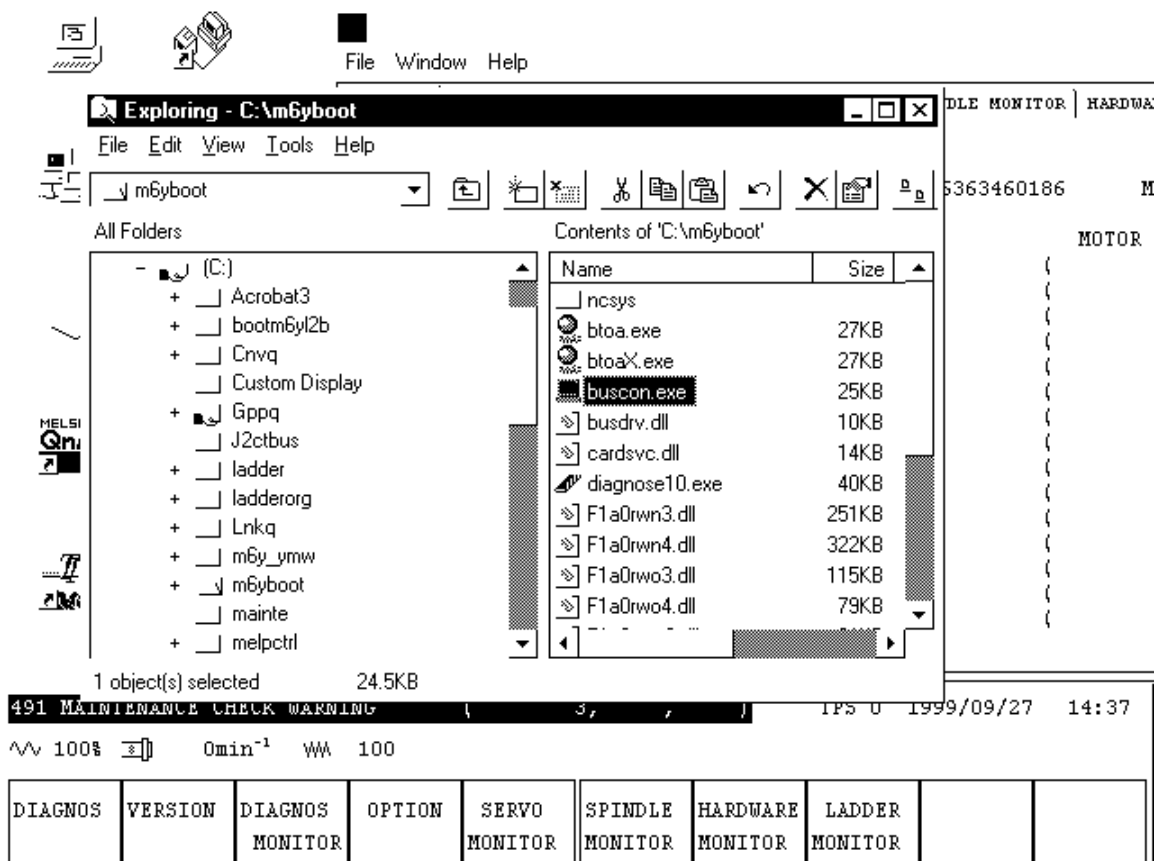
- 1) Go to Explorer and find the M6YBoot folder.
- 2) Find TrsData2.exe and double click on to execute.
- 3) Press START button and it will write the data onto floppy diskette under filename Sramdt01.asc.
- 4) Send us the file along with bit maps or Jpeg image of the Tool Data page, Position(Command) screen, and any other important pages. Please remember the the bit maps are about 300k so can only get 3 to 4 per floppy diskette.

The following is explanation on using the Buscon software on Control to save data for a problem where control will hangup in a cycle start mode.

1) Power off control and plug in an external keyboard on back of the operator control panel. On Dual Turn/Mpx op. panels, the port is located above the hard drive. On other machine types, just below the hard drive.

Note: Uses IBM PS/2 connector.

2) Start up the Printkey software. See Appendix A for Printkey software instructions.



3) Using Windows Explorer, select Buscon.exe in the C:\m6yboot directory.

At this point, wait for problem of cycle hangup to reoccur, before going to next step

Bus Console Window (0xd800)							
[F1] Y^e(A)	[F2] IOW(E)	[F3] IIVV(I)	[F4] IUII(I)	[F5] IwV(H)			
tIsync	smain	807b69d0	0	PEND	8005fb14	807b6928	0 0
tPlc_M	qmmain	807b4500	140	PEND	8005fb14	807b43b8	0 0
tPre_1F	emain	801be2f8	145	PEND	8005fb14	801be160	0 0
tPre_2F	emain	801b5e28	145	PEND	8005fb14	801b5c90	0 0
tFig_1F	figen	801a96f0	155	PEND	8005fb14	801a9678	0 0
tFig_2F	figen	80189220	155	PEND	8005fb14	801891a8	0 0
tFIGURE	figure	80168d50	160	PEND	8005fb14	80168ca8	0 0
tAPLC	aplcm	807b5768	165	PEND	8005fb14	807b56f8	0 0
tAtcom	atmain	807b3298	170	PEND	8005fb14	807b3228	0 0
tPre_3F	emain	801ad958	171	PEND	8005fb14	801ad7c0	0 0
tPcmn	qcmngl	8015d3b0	171	PEND	8005fb14	8015d230	0 0
tGpp	gppe	8015e618	172	DELAY	80024814	8015e4c0	2000009 1
tGppfrom	gpFrom	8015bba0	173	PEND	8005fb14	8015bb30	0 0
tPre_1B	emain	801ba090	175	PEND	8005fb14	801b9ef8	0 0
tPre_2B	emain	801b1bc0	175	PEND	8005fb14	801b1a28	0 0
tFig_1B	figen	80199488	185	PEND	8005fb14	80199410	0 0
tFig_2B	figen	80178fb8	185	PEND	8005fb14	80178f40	0 0
tCmdTask	cmd_Main	80162ae8	200	PEND	8005fb14	80162188	1000016 0
tMdlTask	mdl_Main	80160880	208	DELAY	80024814	80160818	0 1
tExcTask	excTask	807fa6c8	220	PEND	80076300	807fa5d8	0 0
tLogTask	logTask	807f7cf0	220	PEND	80076300	807f7c00	0 0
tNetTask	netTask	807f2f88	230	PEND	8005fb14	807f2f00	0 0
tShell	shell	8015b168	230	READY	80043cf4	80159db8	0 0
value = 0 = 0x0							
-> i							

When problem occurs, maximize the BusCon and

- 5) Type in the letter i (Small i) Will default to small i due to previous step 4 where had selected S for small.
- 6) Do a Printkey of data displayed. One of the data will say Busy or something. That should tell Japan something.
Reason for External Keyboard is that machine keyboard is probably locked up when problem occurs. If press PrintScreen key on external keyboard, will call up the Printkey software.
- 7) Do a printkey of Key History page. This will show keys pressed before problem occurred. e.g. Operator changed offset?, etc.
- 8) Next, do a PrintKey of the Position page and Alarm History.
- 9) Save all data to a floppy diskette and to SRAM(see M640_Data_Save_Sram_Procedure).

Appendix A (How to use PrintKey software)

The following is quick explanation to use printkey.exe

This software will generate a hardcopy of screen and allow you to save to a file without having a keyboard to do PrintScrn.

This software is freeware and can be distributed freely as long as no money exchanges hands.



To use, execute the printkey.exe. This will place the printkey icon down by date on taskbar. If you wish to make a hardcopy of screen, simply click with left mouse button. To view what you just made hardcopy of either very quickly click twice on left mouse or (preferable) press the right mouse key and select Open. When select Open you will see the screen saved.

Click on the left floppy diskette to save to a file. Type in the filename and use either *.bmp or *.gif extension for saving. Bmp is best picture, but takes about 300 to 600k and vs about 7k to 14k for gif. So, you can put more Gif pictures on a diskette.

Note1: If you have a keyboard and press the PrintScrn key, the printkey software comes up.

Note2: You can use this software on your desktop pc if has Win95. Don't know about WinNT or Win98. This is useful for viewing saved files and printing and also for saving to clipboard to use in Word documents.

Note3: You can edit the area and save to clipboard using this software's tools.

Note4: If you click on right mouse and select Open, then the screen print will not show the Window's taskbar. Allowing you to show full Mazatrol menu keys.

INDEX

M640_Class_Index_Alphabetically_November99.doc

The following is an index of the M640 Procedures in alphabetical order:

Document Title	Page
M640_Com	1
M640_Com_Hyperterminal	10
M640_Data_Save_Procedure	65
M640_Data_Save_Buscon	109
M640_Data_Save_Sram_Procedure	108
M640_Data_Xfer_3Digit_For_M640T	2
M640_Data_Xfer_3Digit_For_M640M	6
M640_Ethernet_Card_Instruction	34
M640_Ethernet_Network_Logon_Bypass	33
M640_Floppy_Installation	94
M640_Hard_Disk_Replacement	95
M640_HR841_Installation(PcMcia card reader)	98
M640_Macro_Print	31
M640_Maintenance_Display	71
M640_NC_Claim_Report	56
M640_Option_Installation_Procedure	100
M640_Option_Overload_Detect	106
M640_Parameter_Servo_Spindle_O_PitchError	66
M640_Plc_Display_Explanation	73
M640_Plc_Corruption_Recovery	75
M640_Plc_Saving_Floppy	76
M640_Plc_Update_Floppy	82
M640_Plc_Lpc_File_Explanation	86
M640_Printkey_Instructions	24A
M640_Printer_Information	25
M640_Printer_Setup_Print_To_File	26
M640_Re-Initialization	64
M640_SanDisk_Explanation	104
M640_Service_Drive_Directory	48
M640_Servo_Update_Procedure	67
M640_Software_B_Version_Main_Update_Procedure	57
M640_SW_Regional_ExplanationB3	47
M640_Version(M)	53
M640_Version (MT)	54
M640_Version(T)	55