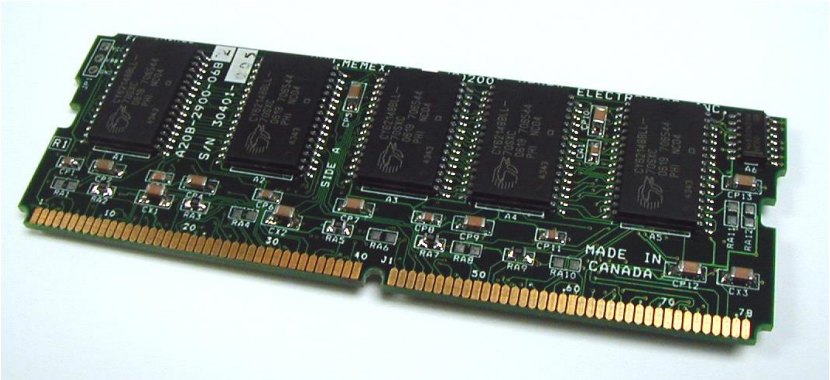
Measuring Manufacturing Excellence

# Memory Upgrade for the Fanuc 15B CNC

## Installation Instructions



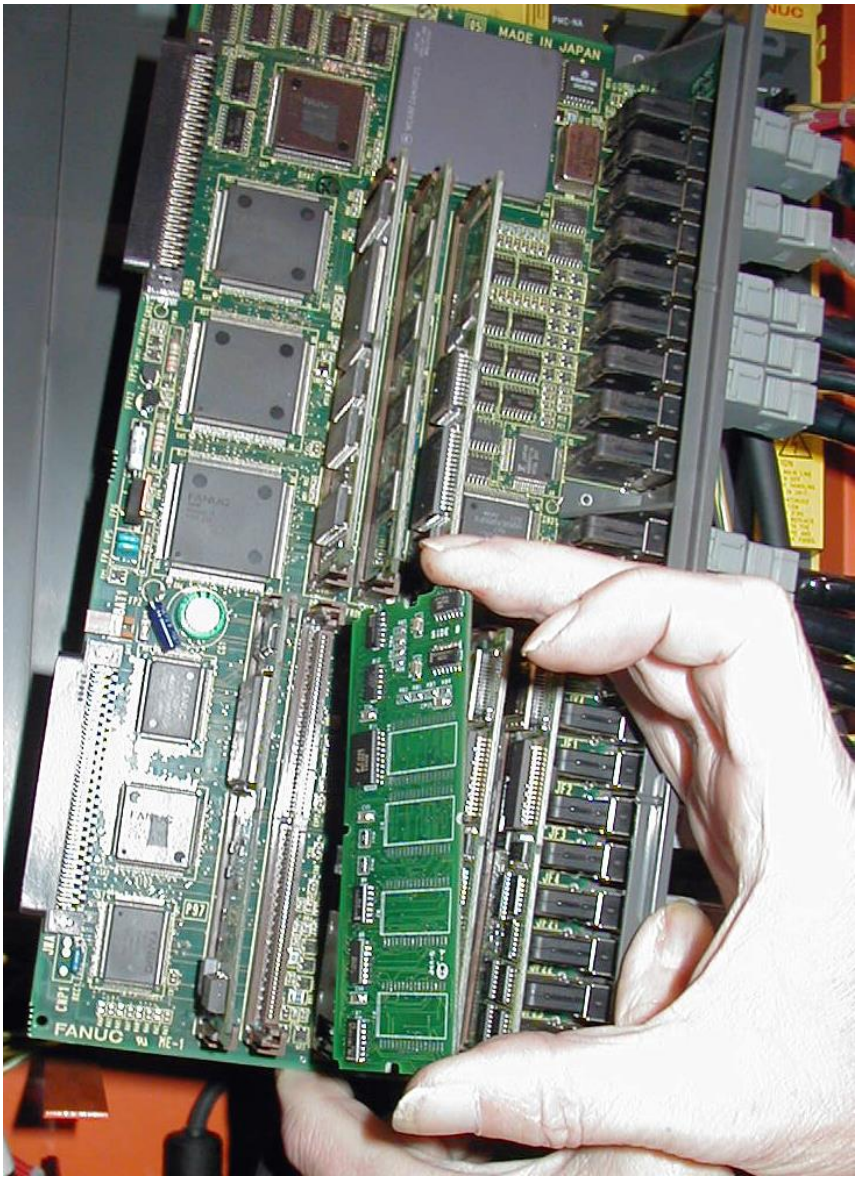



**Memex Automation Inc.**
105 – 3425 Harvester Road
Burlington, Ontario Canada
L7N 3N1

Ph: 905-635-3040 Fax: 905-631-9640

www.memex.ca

***Part of the Astrix Group of Companies***




Quick Summary: After backing up with the PCMCIA card (and serially backing up the part programs and macros), you can swap the Fanuc SRAM module for the Memex one, restore the FILE1.BAK from the PCMCIA card and then  enable the 2 meg option in IPL mode and reload the part programs (and macros) to get back up and running.

# Table of Contents

# Introduction

Thank you for purchasing the Memex Memory Upgrade Kit for the Fanuc 15B control. At Memex we invest a great deal of effort in the design, manufacture and testing of each unit we build, and back it with a three-year limited warranty. We are confident you will find this upgrade significantly improves to your machining operations.

## General Information

The installation procedure is straightforward and relatively easy to complete – backup the parameters and programs, swap the memory module, and restore the parameters and programs. All that's needed are some basic skills and hand tools. Estimated time required: 1 hour.

The Fanuc 15B can be upgraded to a maximum of 5120 meters (2 megabytes) of part program storage. The SRAM-based memory is resident on a Single In-Line Memory Module or "SIMM" that is located on the Main CPU board. This "CPU" board is one of the grey slots in the yellow plastic box, close to the right side. The CPU board, once removed, can keep the SRAM module powered for over 30 minutes via a high capacity (1 Farad) backup capacitor.

**IMPORTANT:** Please see "Applicable CPU Boards" on page 10. This SIMM must not be installed in a board not listed in the table. If the intended CPU board is not listed, please contact Memex Technical Support. Contact information is listed on page 20 of this manual.

Fanuc SRAM Module Listing

| | | |
|---|---|---|
| 2MB | A20B–2900–0682 | ← Memex Module |
| 1MB | A20B–2900–0680 | |
| 512KB | A20B–2900–0681 | |
| 256KB | A20B–2900–0700 | |
| 128KB | A20B–2900–0701 | |
| 64KB | A20B–2900–0711 | |

## Installation Considerations

The memory upgrade should be conducted with care. Never install or remove a board with the control power on (the main power can be on, but not the control). Take care when handling circuit boards, as they are static sensitive. Keep the boards in the anti-static bag provided. Do not place the SIMM in any other slot on the Fanuc CPU board. Do not force, drop or otherwise mishandle the boards during the installation procedure.

## About this Manual

This manual explains how to install the Memex Memory Upgrade Kit for the Fanuc 15B control, and consists of the following sections:

***Installing the Fanuc 15B Memory Upgrade*** explains how to install the Memex Memory Upgrade Kit into the Fanuc 15B CNC. It consists of sections regarding backing up the control's memory contents to both a PCMCIA memory card and a computer, removing the existing CNC memory module and installing the new one, changing some settings to use the new memory size, and restoring and verifying the control.

***Fanuc 15B Technical Summary*** provides brief summaries of the procedures to punch and read data, critical parameters and their settings, serial port and cable configuration information, applicable CPU boards and memory modules, and PC Card backup file naming conventions.

***Technical Support*** provides contact information for technical support and customer service.

***Appendix A: Parameter Records*** provides tables for manually recording critical parameters before performing the memory upgrade. These parameters must be re-entered manually before restoring the parameter backups after the memory upgrade. *It is critical that they be copied down accurately.*

# Installing the Memex Memory Upgrade

## Backup All Parameters

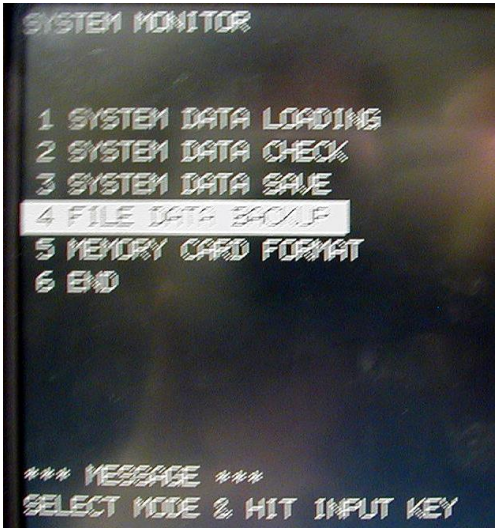
The Memex Memory Upgrade for Fanuc 15B kit may include an optional PC Card Memory that allows easy backup of existing CNC settings. The process backs up all parameters into non-volatile memory on the card. The card may then be kept as a safety backup of the pre-upgrade configuration in case a quick reversal of the upgrade is ever required, or updated after the upgrade to facilitate a quick restore of the new configuration in the event of any parameter change or loss.

### Backup to PCMCIA SRAM Card

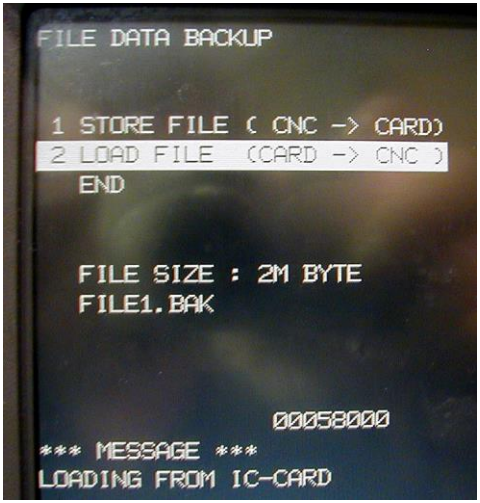
Before starting the installation, power on the control and verify that the machine tool is in good working order. If the control has an SRAM system error and is inoperable, then you will have to replace your SIMM with the new one, and restore the information from existing parameter backups.

1. Home the machine before performing the memory upgrade.
2. Insert the PCMCIA SRAM Card into the vertical MEM slot on the CPU card in the main rack (with the top label facing left). It goes in only a short way and can be inserted with the power ON or OFF.
3. Power ON the control holding down the Page Up and Page Down keys to access the INITIAL PROGRAM LOAD (IPL) screen (see note below).
4. Note that the PCMCIA card comes formatted and ready for use already. Note that some Dell laptops have a power save mode that can affect usage – check reading and writing capability with your laptop before use.
5. Select the 4 for FILE menu and press INPUT to change to the CNC SRAM Backup screen (cursor keys may be used for this as well).

**Note:** If the CNC has an Option board that also has SRAM, it needs to be backed up as well. An intermediate menu will appear in this case. Select each line and backup up the files indicated (if present).




SYSTEM MONITOR Screen




Select 4 for FILE Menu and Hit Enter to Get the Store, then 1 for STORE to backup the FILE1.BAK to the PCMCIA card.

6. Type 1 + INPUT (or cursor to it) for the STORE (CNC-CARD). Save the SRAM files to the PCMCIA card..

7. Back out of that menu by using the soft keys to select END. (Once at the main menu you can check the contents of your SRAM card by selecting MEMORY CARD FILE DELETE and **just looking** at what files are available for deletion. Then *back out of this menu without deleting anything* after looking.)

8. On the main screen, go to the bottom and select END, then press YES to leave this area and reboot the control. The file(s) backed up to the SRAM card may be checked via a notebook PC's PCMCIA slot. Unlike a Fanuc 16/18 the backup file name doe not change between memory board upgrades.

## *Record Settings & Options – Manual Backup if Needed*

**Settings**

1. Note which type of display monitor the control has – whether it is colour or monochrome, 74- or 80-character width.

2. Using the forms on page 28 & 29, record SETTING ("Handy") screen data. To display the parameters, Press the SERVICE, PARAM soft keys. Enter the number of the parameter to be displayed and press INP–NO. The screen can also be changed using the cursor or page key.

3. Write down the serial port settings in parameters 0, 20-23 and 5000 series. The grey boxes are for the Remote Buffer Unit, if that option card is present. Also record parameter 9000 in the space provided under the SETTING screen chart.

**Options**

4. Using the form on page 28, record all parameters in the 9100 series. Using the Conversion Chart on page 28, convert the binary values to hexadecimal format. Skip the three "Updated" boxes.

## *Backup to Computer – Manual Backup if Needed*

1. If not already connected, connect the CNC to a PC with a serial data cable *(see* "Standard Fanuc Serial Cable", *page 25)*. You will need a communications program (such as a DNC system or at least a terminal program) to download and upload the parameters. Make sure the software's communications settings match the CNC's.

**NC Parameters**

2. Get the computer ready to receive the NC data.
   - Select EDIT mode.
   - Press the SERVICE then the PARAM soft keys.
   - Press the PUNCH then the PARAM softkeys.

**Pitch Error Compensation**

3. Get the computer ready to receive the Pitch Error Comp. data.
   - Confirm that EDIT mode is selected.
   - Press the SERVICE then the PITCH soft keys.
   - Press the PUNCH then the PITCH softkeys.

**Part Programs**

4. Set parameter 0011.0 and 2201.0 to 0 to *unprotect* part programs in the 8000 series and 9000 series. Get the computer ready to receive part programs.
   - Confirm that EDIT mode is selected.
   - Press < then PROGRAM. Press > until PUNCH appears.
   - Press PUNCH then ALL.

**Offsets**

5. Get the computer ready to receive the Tool Offset data.
   - Confirm that EDIT mode is selected.
   - Press < OFFSET CHAPTER TOOL > PUNCH.

**PMC Data – Communications Settings**

7. The PMC area has a setting for baud rate that is separate from the normal serial port settings. Set them to match the settings for other serial communications so the PMC data can be easily backed up. Press the CNC/PMC key to display the PMC screen. If the softkey list matches this diagram, skip to step 8 (on the 9" CRT the "ETC." key switches between the two rows):

| | | | | |
|---|---|---|---|---|
| PCMDI | PCLAD | PDDGN | PCPRM | |

| | | | | |
|---|---|---|---|---|
| RUN/STOP | EDIT | I/O | SYS/PRM | |

- Press the CNC/PMC key to display the NC screen. Then put the CNC in the MDI mode or emergency stop mode.
- Press the SETTING soft key to display the setting screen. Enter 8000 and press the INP–NO. softkey to display Parameter No. 8000. If PWE (8000.0) is set to 0, change it to 1. Ignore alarms.
- Press the CNC/PMC key, then the PCPRM and KEEPRL soft keys to display the Keep Relay screen.
- Press the Page Down key until the screen that contains the K17 data line is displayed. Record the existing value for K17 in space provided under the SETTING screen chart on page 28. Place the cursor at the K17 data using the cursor keys, and enter 1 0 0 0 0 0 0 0 and press the INPUT soft key.
- Press the RETURN key on the right of the soft keys several times to display the soft key menu as shown above.

8. Press the soft keys I/O , FDCAS , CHANEL. Enter the channel number and press EXEC .
   - To change the baud rate, press the PCPRM then MODE softkeys. Then place the cursor at DATATRANSFERRATE (AUX) using the ↓ (cursor down) key. Press the soft key to display the desired baud rate.
   - If the K17 data for the keep relay was changed in step 11, restore it to the original setting.

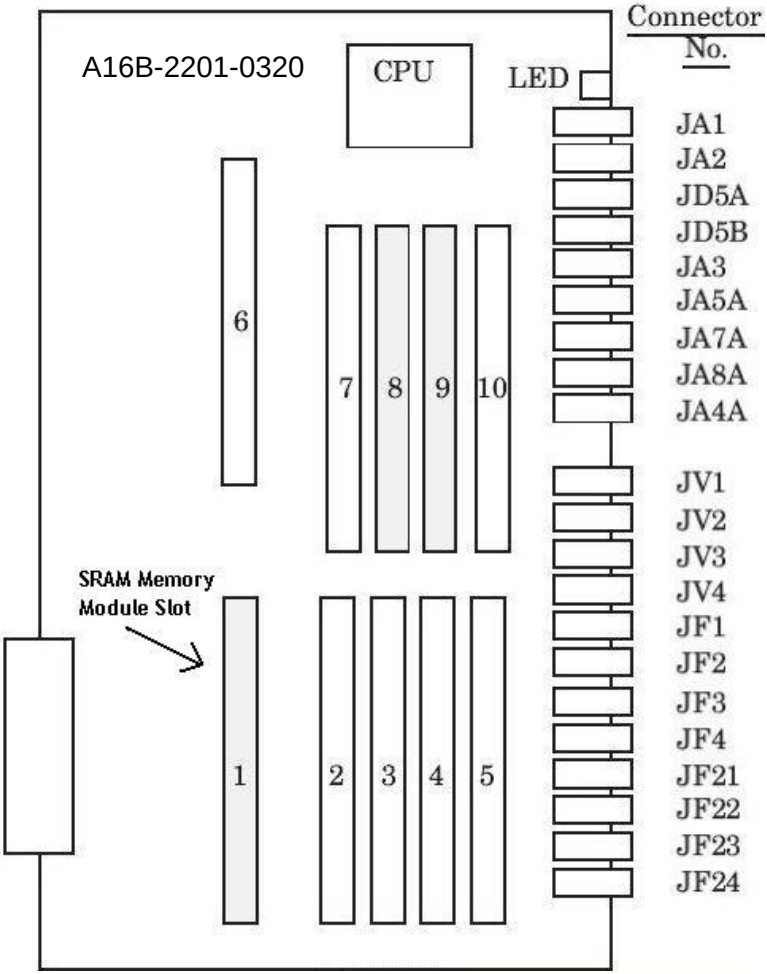
**PMC Data – Output**

9. Get the computer ready to receive the PMC data.
   - If necessary, press the NC/PC soft key to display the PMC screen.
   - Press the PCPRM soft key to display the PC parameter screen. The soft keys are displayed as shown (on the 9” CRT the ETC. or right most soft key to switch between the two rows):

| | | | | |
|---|---|---|---|---|
| TIMER | PCLAD | KEEPRL | DATA | POS |

| | | | | |
|---|---|---|---|---|
| MODE | I/O | CLRPRM | | |

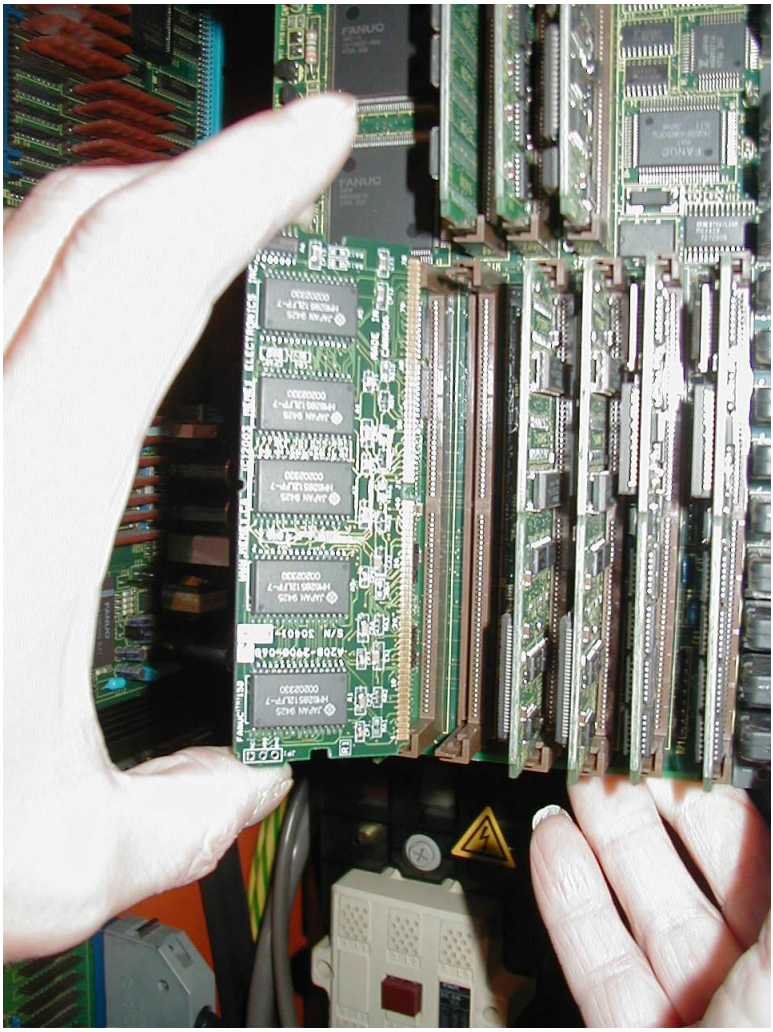
   - Press the soft keys I/O OUTPUT PARAM CNC. Enter the file name and press the ADD key. The corresponding addresses are displayed to show that the data is correctly output.




*Fanuc 15B CPU Card (A16B-2201-0320) Layout Diagram*

**<u>Fanuc 15B MAIN CPU Card SRAM Slot Chart:</u>**

| | | |
|---|---|---|
| **MAIN-A** | **A16B-2201-0300** | **Slot 2** |
| **MAX MAIN-A** | **A16B-2201-0340** | **Slot 2** |
| **MAIN-B** | **A16B-2201-0320** | **Slot 1 (above)** |
| **MAIN-C** | **A16B-3200-0060** | **Slot 2** |




*Detail showing the installation of a Memex 2 Meg SRAM card in Slot 2 of a MAIN-C A16B-3200-0060 CPU card.*

**Note:** Slot 2 at the lower left is the SRAM slot. An existing SIMM may or may not be present. If this diagram does not match your CPU card, refer to your Maintenance Manual to determine the SRAM location.

## Upgrade Memory Size Option Parameters

After restoring the PCMCIA backup files you will have to change the option parameters via the IPL screen – power on holding “+” and “-“.

Three specific option parameters contain bits that must match the size of memory installed. The bits turned on for the previous memory size must be turned off, and the correct ones for the new size turned on. The NC parameters can also be changed manually by opening the backup file with an editor and changing the correct two bits. In either case, record the new values in the “Updated” boxes in the form on page 22, in both Binary and Hexadecimal format.

If changing the parameters manually, be sure to identify the existing setting and set its corresponding bit to zero, as well as setting to 1 the bit corresponding to the new memory size (such that only one of the following bits is a 1 and the other six are all 0). Be sure not to change any bits that are not listed here:

| Memory Size | Option |
|---|---|
| 32 KB (80 M) | 9110.4 |
| 64 KB (160 M) | 9120.2 |
| 128 KB (320 M) | 9120.3 |
| 256 KB (640 M) | 9120.5 |
| 512 KB (1280 M) | 9134.0 |
| 1 MB (2560 M) | 9134.1 |
| 2 MB (5120 M) | 9134.2 |

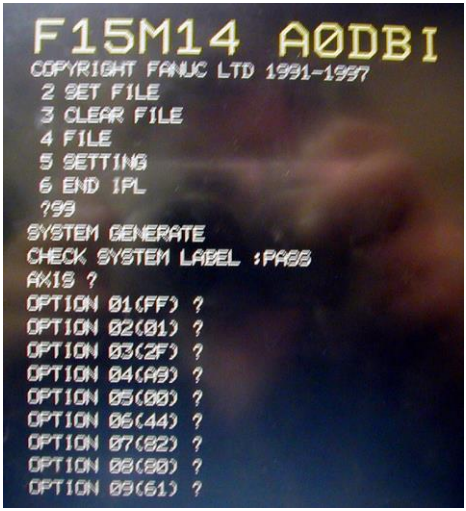
For example, if upgrading from 256 Kb to 1 Mb, #9120.5 would need to be changed from a 1 to a 0 (xx1x xxxx $\rightarrow$ xx0x xxxx) and #9134.1 from a 0 to a 1 (xxxx xx0x $\rightarrow$ xxxxxx1x). It is important not to change any other bits (represented by “x”) in each parameter.

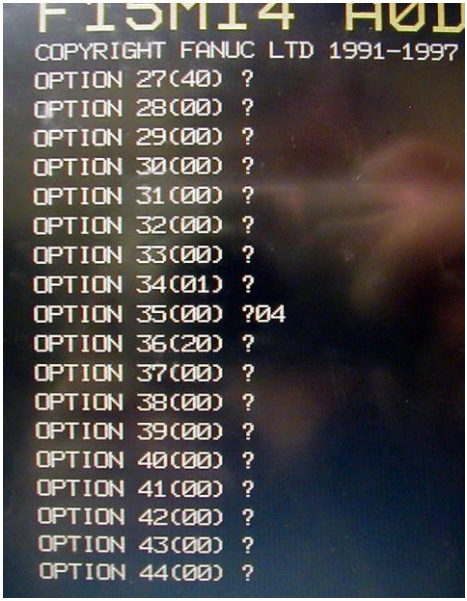
To change parameters, you can either modify the parameter list and upload it or hand code it in with the following procedure.

1. Get to the IPL screen.
2. Type in 99, then INPUT.
3.

If you hit INPUT only (and type in no value) the existing value will be maintained. Change only the ones you need (turning off the old memory

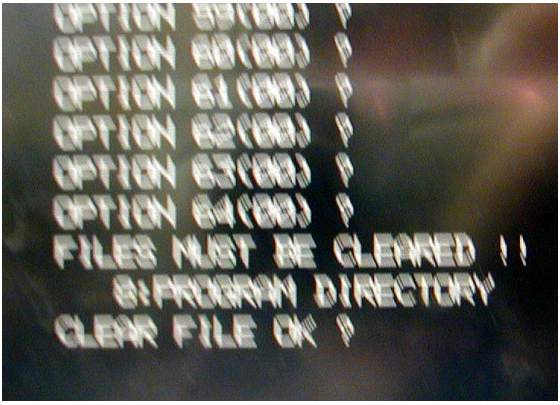
option bits and turning on the 2 Meg option P9134 bit 2. The above photo shows what has to be deleted (by inputting a “Y” for YES).




**NOTE:** Parameters referred to as a four-digit number with a decimal place denote the parameter number and bit number. For example, 9110.4 means bit 4 of parameter #9110. Bits are ordered 76543210.

Therefore #9110.4 is the underlined one in “xxx**x**xxxx”. To get 2 megs, add in (via an XOR or adding in the existing bits) the value of hex 04 to Parameter 9134 (OPTION 35 as seen above).




Note that the clearing of the program directory will delete all part program files and the macro 9000 and 8000 files. Make sure you have a proper backup of them before you hit “Y” at this point.

If you see any other item rather than 8 to delete the PROGRAM DIRECTORY, then you may want to say “N” and restart the “99” procedure.

# Install the New Memory Module

Make sure that there is a current backup of NC Parameters, Pitch Error Compensation, Offsets, PMC Parameters and Part Programs as explained in "Backup All Parameters" starting on page 2. ***The following steps will delete all data from your control.***

**Remove CPU**

1. With the Fanuc control powered off and the Emergency Stop button depressed, access the yellow plastic electronic card rack. Find Slot 1, second from the right, labelled as the Main CPU board. Locate the tabs on the top and bottom. Squeeze the tabs and carefully pull the board out. The unit can often be removed with all the cables attached if the shield clamps are loosened beforehand. If not, carefully label the cables and the points they connect to so they can be correctly reconnected later, and remove cables as necessary.

**Install Memory Module**

2. Locate the existing memory module – see diagram on page 7 or refer to your Maintenance Manual. It is labelled SRAM. Remove it carefully by opening the small tabs and gently tilting it towards the back. Insert the new module the same way *(note the keyway)*. It should click into place. Now put the CPU board back into its slot and make sure all cables are correctly connected, well seated and secured.

**Clear Memory**

3. With the "7" & "9" keys depressed, power on the control, and keep the "7" & "9" keys depressed until you see the message "CLEAR FILE: RAM TEST". This will clear the entire memory module. If the control will not power on at this point, check that main power is restored and the cabinet door interlock is bypassed. The control may take a few seconds to clear the entire memory.

4. **NOTE:** If you have a Loader OP3 board, it too will be cleared in this procedure. It seems that TT controls are not affected however, as the L/R switch selects the side to clear.

The SIMM has now been initialized and all parameters must be restored.

# Restore The Control

## Restore From PCMCIA SRAM Card or From Computer

The remaining parameters may be restored from either the PCMCIA SRAM card backup or the computer backup. Choose one of the following two options:

### Option 1: Restore From PCMCIA SRAM Card

1. Before the files on the SRAM card can be restored, they must be renamed to correspond to the new memory size. See page 18 for naming conventions and instructions on renaming the backup files.

2. Insert the SRAM card into the PMC CPU slot 2 (see photo at front of manual), with the face pointing left. It goes in only a short way and can be done with the power ON or OFF.

3. Power ON the control holding down the **Page Up** and **Page Down** keys. The SYSTEM MONITOR SERVICE MENU screen should appear.

4. In IPL, select the 4. FILE line and press INPUT to LOAD the backup files. The CNC will check the PCMCIA card for the FILEx.BAK files. Use the original FILE1.BAK and either create blank FILEx.BAK from the 512k blank SRAM file we have on our web site (see www.memex.ca under Support, Software Utilities at the bottom – see SRAM2_5D.FDB and copy and rename it to get all 5 FILEx.BAK files.

9. Proceed to reload the SRAM backup files.

10. Back out of that menu by using the soft keys to select END. On the main screen, go to the bottom and select END, then press YES to leave this area and reboot the control.


## *Restore Settings & Options – Manual Method if Needed*

Before restoring parameters from backup copy, the settings and options must be restored manually. The control should still be in IPL (Initial Program Load) mode after initializing the memory.

**Monitor Type**

1. Select #5 and enter the type of monitor the control has:

| | |
|---|---|
| 1 = Colour, 74 character width | 3 = Monochrome, 74 character width |
| 2 = Colour, 80 character width | 4 = Monochrome, 80 character width |

**System Label and No. of Axes**

2. Type [9][9] and press [INPUT]. Press [Y] to generate the System Label.

3. Enter the number of axes and press [INPUT]. This number refers to the number of control axes (displayed on the Position screen), not those auxiliary axes not controlled by the CNC itself. Things such as a rotary table can be controlled either by the CNC or by its own control. Fortunately, parameter 9000 stores the number of control axes, so enter the value recorded for #9000 in the form on page 21.

4. Enter the 9100 series Option parameters from the form on page 22. These must be entered in Hexadecimal format. *Be careful here,*

*since if an incorrect value is input, you must press* RESET *and re-enter all options from the beginning, starting with* 9 9 INPUT. Remember to enter the *updated values* for Options 11 (#9110), 21 (#9120) and 35 (#9134). After entering all the 9100 series parameters from the form, just keep pressing INPUT until it finishes asking for the 9100 series. When the series is completed, it will ask to erase certain files (PC/NC parameters, etc.). Press Y .

5. Press 6 and INPUT to exit IPL mode. Ignore the alarms and turn the control power off and back on.

6.

### *Option 2: Restore From Computer*

1. Set the PWE, but set all bits to 1 (set #8000 to 1111 1111). Enable the appropriate serial port by typing in the Setting ("Handy") screen data from the form on page 21.

**Restore NC Parameters**

2. Get the computer ready to send the NC data. Make sure its serial communications settings match the CNC's corresponding settings.
   - Select EDIT mode, and turn the Program Protect key OFF.
   - Press softkeys SERVICE PARAM READ ALL.
   - Send the data from the computer.

**Restore PMC Data**

3. Get the computer ready to send the PMC data. Make sure the CNC is ready to receive the PMC data - see "PMC Data – Communications Settings" on page 5. If the control has special options, such as a 5th axis table, you might need to power on in IPL mode (holding [-] & [.]) and then select a boot without the ladder running.

   Load the PMC data as follows:

4. If necessary, press the NC/PC soft key to display the PMC screen. Press the PCPRM soft key to display the PC parameter screen. The soft keys are displayed as shown (on the 9" CRT the [ETC.] key switches between the two rows):

| | | | | |
|---|---|---|---|---|
| TIMER | PCLAD | KEEPRL | DATA | POS |
| MODE | I/O | CLRPRM | | |

5. Press the I/O soft key, then INPUT . Enter the file name and press EXEC . Send the data from the computer. The corresponding addresses are displayed to show that the data is correctly input.

**NOTE:** When data is read, if RAM ENABLE OFF is displayed, this means that the RAM for the PMC is protected. Press the MODE softkey, place the cursor at RAM ENABLE using the [↓] key and press the ON softkey.

**Restore Pitch Error Compensation**

6. Get the computer ready to send the Pitch Error Comp. data.
   - Confirm EDIT mode is selected.
   - Press the SERVICE then the PITCH softkeys.
   - Press READ then ALL.
   - Send the data from the computer.

**Restore Offsets**

7. Get the computer ready to send the Tool Offset data.
   - Confirm EDIT mode is selected.
   - Press < PROGRAM .
   - Press > until the READ softkey appears.
   - Press READ.
   - Enter a program number (that's not being used). Press EXEC .
   - Switch to MEMORY mode. Press the CYCLE START button.
   - Once the program finished executing, delete it.

**Restore Part Programs**

8. Set parameter 0011.0 and 2201.0 to 0 to *unprotect* part programs in the 8000 and 9000 series.
   - Confirm EDIT mode is selected.
   - Press < PROGRAM .
   - Press > until the READ softkey appears.
   - Press READ ALL.
   - Send the part programs from the computer.

## Verify The Control

Once the upgrade is completed, including the reloading of all parameters, test the machine via the following procedure.

**IMPORTANT:** *Do not move the machine until you are sure all parameters have been restored.*

- Change to either MDI mode or Program mode.
- Home all axes, tool changers and pallets.
- Check spindle functionality through all speeds and gear ranges.
- Check Clockwise and Counter-clockwise spindle rotation with M3 and M4 commands.
- Check the tool changer. Be sure that the tool received was the tool requested and that the carousel rotates in the proper direction.
- Check the pallet changer (if applicable). If the machine requires special custom macros for a pallet changer or tool changer, be sure that they are present.

**Option: Update PCMCIA SRAM Card**

Now that the control is set to work with the new memory size, the PCMCIA memory card can either be updated with the new parameters to act as a safety backup of the new configuration (refer to “Backup to PCMCIA SRAM Card” on page 8), or kept as is as a convenient means of restoring the control to the previous (pre-upgrade) state.

# Installation Checklist

- Check machine - Power ON and check for problems before starting.
- Backup settings, options, parameters and programs.
- Power OFF.
- Depress E-STOP.
- Backup with PCMCIA card – power on with Page Up & Page Down
- Unprotect macro programs (9000s), then backup part programs.
- Power Off
- Change old Fanuc SRAM card with Memex 2 Meg one.
- Power On the Control with 7 & 9 to clear all.
- Power off, Power on Holding Page Up & Page Down – restore the FILE1.BAK (and other files).
- Cycle the Power – power up holding "+" & "-" for the IPL screen
- Perform the 99 sequence with the 21 digit passcode and add in the bit 3 of P9134 (04 usually) to get the option enabled.
- Set PWE to enable.
- Restore settings & options.
- Restore parameters & part programs.
- Check the parameters and machine operation thoroughly.

# Fanuc 15B Technical Summary

## Punching

| | |
|---|---|
| NC Parameters | EDIT mode; softkeys SERVICE PARAM PUNCH PARAM |
| Pitch Error Compensation | EDIT mode; softkeys SERVICE PITCH PUNCH PITCH |
| All Programs | EDIT mode; softkeys < PROGRAM ; > (until PUNCH appears), PUNCH ALL |
| Offsets | EDIT mode; softkeys < OFFSET CHAPTER TOOL > PUNCH |

## Reading

| | |
|---|---|
| NC Parameters | EDIT mode; softkeys SERVICE PARAM READ ALL |
| Pitch Error Compensation | EDIT mode; softkeys SERVICE PITCH READ ALL |
| All Programs | EDIT mode; softkeys < PROGRAM ; > (until READ appears), READ ALL |
| Offsets | EDIT mode; softkeys < PROGRAM ; > (until READ appears), READ PROG#, (Type in a program #), EXEC ; MEMORY mode; CYCLE START |

## Initializing

| | |
|---|---|
| Erase *Entire* Memory | Power On holding 7 & 9 with Write Protect Key off |

## Typical Serial Communications Parameter Settings

*NOTE: These parameters do not apply if using a Remote Buffer Unit (OP1 Board).*

| Parameter | Description | Setting |
|---|---|---|
| 0.0 | TVC, Tape Vertical Check | 0 = Do not perform TVC |
| 0.1 | CTV, Count TVC characters | 1 = Do not count |
| 0.2 | ISP, ISO codes have Parity bit | 0 = Yes |
| 0.3 | NCR, EOB format | 0 = LF CR CR |
| 0.4 | EIA, Select EIA or ISA | 0 = ISO |
| 20 & 22 | Fore-& Background Input channel | 0 or 1 = Connector JD5A |
| 21 & 23 | Fore-& Background Output channel | 1 = Connector JD5A |
| 5001 | Device Number of Channel 1 | 1 = use settings in 5110-5112 |
| 5002 | Device Number of Channel 2 | 2 = use settings in 5120-5122 |
| 5110 | Device type of Device No. 1 | 3 = Xon/Xoff, no feed char. |
| 5111 | No. of Stop Bits of Device No. 1 | 1 or 2 = No. of Stop Bits |
| 5112 | Baud rate of Device No. 19 =2400, 10 =4800, 11 =9600 | |

5120 – 5122 = same as 5110 – 5112 but for Device No. 2

### Applicable CPU Boards

| | |
|---|---|
| A16B-2201-0320 | A16B-2201-0300 |
| A16B-2201-0340 | A16B-3200-0060 |

### Available Memory Modules

| Fanuc Part Number | Type | Size |
|---|---|---|
| A20B-2900-0711 | A | 64 KB |
| A20B-2900-0701 | B | 128 KB |
| A20B-2900-0700 | C | 256 KB |
| A20B-2900-0681 | D | 512 KB |
| A20B-2900-0680 | E | 1 MB |
| A20B-2900-0682 | F | 2 MB |

### Standard Fanuc Serial Port: (db25 Female)

| | |
|---|---|
| 1 = Frame Ground | 6 = Data Set Ready |
| 2 = Transmit Data | 7 = Signal Ground |
| 3 = Receive Data | 8 = Carrier Detect |
| 4 = Ready To Send | 20 = Data Terminal Ready |
| 5 = Clear To Send | 25 = +24 Volts |

### Standard Fanuc Serial Cable

| *Computer* | | *Fanuc* |
|---|---|---|
| 25-pin Female | to | 25-pin Male |
| Tx – 2 | - | 3 – Rx |
| Rx – 3 | - | 2 – Tx |
| RTS – 4 | - | 5 – CTS |
| CTS – 5 | - | 4 – RTS |
| SG – 7 | - | 7 – SG |
| | | 6-8-20 jumpered |
| FG – 1 | - | No Connection |
| 9-pin Female | to | 25-pin Male |
| Tx – 3 | - | 3 – Rx |
| Rx – 2 | - | 2 – Tx |
| RTS – 7 | - | 5 – CTS |
| CTS – 8 | - | 4 – RTS |
| SG – 5 | - | 7 – SG |
| | | 6-8-20 jumpered |
| FG – (D-shell) | - | No Connection |

## Fanuc Protocol: E,7,x

The standard serial communications protocol for Fanuc controls is always Even Parity and 7 Data Bits. Stop Bits are either 1 or 2, as set via parameter 5111 or 5120 (see “Typical Serial Communications Parameter Settings” on page 23).

## PCMCIA Memory Card File Naming Conventions

The file(s) saved on the PCMCIA memory card during backup are named according to a set of naming schemes, depending upon memory module size. When performing a restore operation after a memory upgrade, files backed up from a different memory size can be used to fill the larger new memory board in part.

| Memory | PCMCIA Backup File Naming Scheme |
|---|---|
| 256k-512K | FILE1.BAK (original) |
| 2 Megs | FILE1.BAK (same as original) |
| | FILE2.BAK |
| | FILE3.BAK |
| | FILE4.BAK |
| | FILE5.BAK |

**Note:** When upgrading to 2 Megs, the missing files can be ignored or if you download the blank 512k file we have on our web site called “SRAM2_5B.FDB” in the software utilities area. The missing BAK files can be created with this file – copy and rename it until you have all the files needed. This process also enables a clearing of memory as “0’s” are written to the memory in the 512k sectors related to the files.

Fanuc SRAM Module Listing

| | | |
|---|---|---|
| 2MB | A20B–2900–0682 | ← Memex Module |
| 1MB | A20B–2900–0680 | |
| 512KB | A20B–2900–0681 | |
| 256KB | A20B–2900–0700 | |
| 128KB | A20B–2900–0701 | |
| 64KB | A20B–2900–0711 | |

# Memex Technical Support & Service

In case of technical difficulty with the memory upgrade procedure, please contact your Memex dealer, or call Memex Automation Technical Support at **1-905-635-1540**.

The next pages of this manual may be used to record technical information, service advice, etc. as needed.

If you have any other questions or concerns, need answers to technical questions, or need information about Memex products and/or services, please contact your local Memex dealer, or contact Memex Automation:

**Memex Autmation Inc.**
200-3425 Harvester Road
Burlington, Ontario  Canada L7N 3N1

**Phone:** 905-635-1540 **Fax:** 905-631-9640
**Web:** www.memex.ca
**Email:** sales@memex.ca support@memex.ca

# Appendix A: Parameter Records

Fanuc System 15B Machine Parameter Worksheet

Company:_____ Machine No.:_____ Date:_____

Fanuc 15B Software Version: _____ Main CPU Board No.:_____

**Setting Data Screen**

| | | | | |
|---|---|---|---|---|
| Parameter Write | | Sequence Stop (Program No.) | | |
| TV Check | | Sequence Stop (Sequence No.) | | |
| Punch Code | | X Axis Mirror | | |
| Input Unit | | Y Axis Mirror | | |
| I/O Channel | | No. of Axes: | #9000 | |
| | | PMC Parameter Transfer Control: | #K17 | |

**Serial Communications Parameters** **Note:** Grey boxes are for Remote Buffer Unit (RBU board, labelled "OP1").

| Par.# | Value | | | Par.# | Value | Par.# | Value | Par.# | Value | Par.# | Value | Par.# | Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | 5001 | | 5071 | | 5081 | | 5110 | | 5120 | |
| 20 | | 22 | | 5002 | | 5072 | | 5082 | | 5111 | | 5121 | |
| 21 | | 23 | | 5070 | | 5073 | | 5083 | | 5112 | | 5122 | |
| 5000 | | | | | | 5074 | | 5084 | | | | | |

**Binary to Hexadecimal Conversion**

| Binary | Hex | Binary | Hex | Binary | Hex | Binary | Hex |
|---|---|---|---|---|---|---|---|
| 0 0 0 0 | 0 | 0 1 0 0 | 4 | 1 0 0 0 | 8 | 1 1 0 0 | C |
| 0 0 0 1 | 1 | 0 1 0 1 | 5 | 1 0 0 1 | 9 | 1 1 0 1 | D |
| 0 0 1 0 | 2 | 0 1 1 0 | 6 | 1 0 1 0 | A | 1 1 1 0 | E |
| 0 0 1 1 | 3 | 0 1 1 1 | 7 | 1 0 1 1 | B | 1 1 1 1 | F |

| Example: 11010101 | |
|---|---|
| 1 1 0 1 = | D |
| 0 1 0 1 = | 5 |
| 1101 0101 = | D5 |
| | |

**Option Parameters**

| Par.# | Binary | Hex | OP# | | Par.# | Binary | Hex | OP# | | Par.# | Binary | Hex | OP# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9100 | | | OP1 | | 9120 | | | OP21 | - Original | 9140 | | | OP41 |
| 9101 | | | OP2 | | 9120 | | | OP21 | - Updated | 9141 | | | OP42 |
| 9102 | | | OP3 | | 9121 | | | OP22 | | 9142 | | | OP43 |
| 9103 | | | OP4 | | 9122 | | | OP23 | | 9143 | | | OP44 |
| 9104 | | | OP5 | | 9123 | | | OP24 | | 9144 | | | OP45 |
| 9105 | | | OP6 | | 9124 | | | OP25 | | 9145 | | | OP46 |
| 9106 | | | OP7 | | 9125 | | | OP26 | | 9146 | | | OP47 |
| 9107 | | | OP8 | | 9126 | | | OP27 | | 9147 | | | OP48 |
| 9108 | | | OP9 | | 9127 | | | OP28 | | 9148 | | | OP49 |
| 9109 | | | OP10 | | 9128 | | | OP29 | | 9149 | | | OP50 |
| 9110 | | | OP11 | - Original | 9129 | | | OP30 | | 9150 | | | OP51 |
| 9110 | | | OP11 | - Updated | 9130 | | | OP31 | | 9151 | | | OP52 |
| 9111 | | | OP12 | | 9131 | | | OP32 | | 9152 | | | OP53 |
| 9112 | | | OP13 | | 9132 | | | OP33 | | 9153 | | | OP54 |
| 9113 | | | OP14 | | 9133 | | | OP34 | | 9154 | | | OP55 |
| 9114 | | | OP15 | | 9134 | | | OP35 | - Original | 9155 | | | OP56 |
| 9115 | | | OP16 | | 9134 | | | OP35 | - Updated | 9156 | | | OP57 |
| 9116 | | | OP17 | | 9135 | | | OP36 | | 9157 | | | OP58 |
| 9117 | | | OP18 | | 9136 | | | OP37 | | 9158 | | | OP59 |
| 9118 | | | OP19 | | 9137 | | | OP38 | | 9159 | | | OP60 |
| 9119 | | | OP20 | | 9138 | | | OP39 | | | | | |
| | | | | | 9139 | | | OP40 | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

**NOTE: A newer machine may have more 9100 series parameters - it is imperative to record them all.**

| No. | Data | No. | Data | No. | Data | No. | Data |
|---|---|---|---|---|---|---|---|
| 0 | | 0 | | 0 | | 0 | |
| 1 | | 1 | | 1 | | 1 | |
| 2 | | 2 | | 2 | | 2 | |
| 3 | | 3 | | 3 | | 3 | |
| 4 | | 4 | | 4 | | 4 | |
| 5 | | 5 | | 5 | | 5 | |
| 6 | | 6 | | 6 | | 6 | |
| 7 | | 7 | | 7 | | 7 | |
| 8 | | 8 | | 8 | | 8 | |
| 9 | | 9 | | 9 | | 9 | |
| 0 | | 0 | | 0 | | 0 | |
| 1 | | 1 | | 1 | | 1 | |
| 2 | | 2 | | 2 | | 2 | |
| 3 | | 3 | | 3 | | 3 | |
| 4 | | 4 | | 4 | | 4 | |
| 5 | | 5 | | 5 | | 5 | |
| 6 | | 6 | | 6 | | 6 | |
| 7 | | 7 | | 7 | | 7 | |
| 8 | | 8 | | 8 | | 8 | |
| 9 | | 9 | | 9 | | 9 | |
| 0 | | 0 | | 0 | | 0 | |
| 1 | | 1 | | 1 | | 1 | |
| 2 | | 2 | | 2 | | 2 | |
| 3 | | 3 | | 3 | | 3 | |
| 4 | | 4 | | 4 | | 4 | |

| No. | Data | No. | Data | No. | Data | No. | Data |
|---|---|---|---|---|---|---|---|
| 0 | | 0 | | 0 | | 0 | |
| 1 | | 1 | | 1 | | 1 | |
| 2 | | 2 | | 2 | | 2 | |
| 3 | | 3 | | 3 | | 3 | |
| 4 | | 4 | | 4 | | 4 | |
| 5 | | 5 | | 5 | | 5 | |
| 6 | | 6 | | 6 | | 6 | |
| 7 | | 7 | | 7 | | 7 | |
| 8 | | 8 | | 8 | | 8 | |
| 9 | | 9 | | 9 | | 9 | |
| 0 | | 0 | | 0 | | 0 | |
| 1 | | 1 | | 1 | | 1 | |
| 2 | | 2 | | 2 | | 2 | |
| 3 | | 3 | | 3 | | 3 | |
| 4 | | 4 | | 4 | | 4 | |
| 5 | | 5 | | 5 | | 5 | |
| 6 | | 6 | | 6 | | 6 | |
| 7 | | 7 | | 7 | | 7 | |
| 8 | | 8 | | 8 | | 8 | |
| 9 | | 9 | | 9 | | 9 | |
| 0 | | 0 | | 0 | | 0 | |
| 1 | | 1 | | 1 | | 1 | |
| 2 | | 2 | | 2 | | 2 | |
| 3 | | 3 | | 3 | | 3 | |
| 4 | | 4 | | 4 | | 4 | |

**Memex Automation Inc.**
105 – 3425 Harvester Rd.
Burlington, Ontario
Canada L7N 3N1
Phone: 905-635-1540 Fax: 905-631-9640
www.memex.ca

**Thank you for using Memex products**

**Sales: (905) 635-3043**
**Support: (905) 635-3041**

\ISO9000\DOCs\M100711D – MAI Memory Upgrade for Fanuc 15B.doc