IBM 8230 Models 001 and 002 - Summary of Microcode Changes

This file contains a cumulative history of the changes to the 8230 Maintenance Facility Program and the 8230 Microcode beginning with Version 2 Release 0 of the microcode. The latest release is first, followed by the earlier releases in descending order by release.

Correction to User's Guide

In the section 'What You Need' the second bullet should read:

- An IBM Shared-RAM Token-Ring Adapter ...

The Maintenance Facility is not capable of operating with a bus master adapter such as LANStreamer.

8230 Microcode Version 2 General Information

- The Version 2 microcode works in either the 8230 Model 1 or the 8230 Model 2
- The Version 2 microcode is compatible with older versions of Maintenance Facility, but some of the new control features will not be available. The Version 2 Maintenance Facility is compatible with older levels of the microcode, but, again, the new functions will not be available.
- The Version 2 microcode will typically remove a hard error (beacon) condition in 10 seconds or less.
- The Version 2 microcode requires installation of the 8230 hardware EC (8230 ECA001). Without this EC, the Version 2 code will experience failures during the address-to-port matching process. The error code returned to LNM or MF will be 6D0A, 6E0A, or 6F0A. The 8230 error display will be 6D, 6E, or 6F.

8230 Maintenance Facility Version 2.2 - Microcode File Identifier - 8230V2R4.BIN

- A filter is added to throw away any unwanted frame. This fixed a broadcast frame problem that kills all the 8230s on a network at the same time.
- Added an automatic reset of the 8230 for multiple MAC errors.

  The 8230 will no longer require a manual reset when two of its three MACs are having problems; instead, it will automatically reset itself.
- Added capability to the dump code.

  The 8230 can now dump its RAM, Adapter Shared RAM, and Adapter MMIO areas through a dump box (a special test tool available from LIP Product Engineering) to a PS/2 station running the dump program.

8230 Maintenance Facility Version 2.2 - Microcode File Identifier - 8230V2R3.BIN

- Fixed a problem in Version 2.1 of the MF program which prevented microcode loads if the 8230 address was not in the '1000xxxxxxxx' range.

  There is no change to the 8230 microcode. It remains at Version 2 Release 3 (8230V2R3.BIN).

8230 Maintenance Facility Version 2.1 Release 3 - Microcode File Identifier - 8230V2R3.BIN

- Fixed a problem in V2R2 which resulted in the 8230 sending unnecessary address mismatch alerts (DFIPD441E) to LNM.
- Included Version 2 Release 2 PTF (UR40719) to allow MF and Ring Diagnostic to run with ISA-16 and Credit Card adapters.

  Note: The MF disk does not contain the adapter driver needed for the credit card adapters. To run with the credit card adapters the machine must be booted to DOS to load the normal Token-Ring adapter driver and the MF executed from the A: disk as a normal program.

8230 Maintenance Facility Version 2 Release 2 PTF - Microcode File Identifier - 8230V2R2.BIN

- Update the MF program to Version 2.1, which is compatible with the 16/4 ISA-16 T-R Adapter.

  There was no functional change to either MF or the 8230 microcode.
- Replace the Ring Diagnostic on the MF disk with a version that is compatible with the 16/4 ISA-16 T-R Adapter.

8230 Microcode Version 2 Release 2 - Microcode File Identifier - 8230V2R2.BIN

- Fixed a problem in V2R1 which resulted in the 8230 sending Lobe Status Change frames to LNM with an empty data field.
- Fixed a transmit queueing condition which resulted in a '6D' error.
- Added this summary of changes file to the MF disk as SUMMARY.CHG.
- There were no changes to the Maintenance Facility program.

8230 Microcode Version 2 Release 1 - Microcode File Identifier - 8230V2R1.BIN

- A Release 0 sensitivity to soft errors has been eliminated.
  - The configuration table algorithm for matching LAM ports to adapter addresses has been corrected to eliminate a problem which caused ports to be repeatedly inserted and de-inserted by the 8230 (known to some as the 'Machine Gun' problem) as it attempted to determine the address matching.
  - A memory pointer problem which caused Release 0 to report operating LAMs as 'Not Connected' has been fixed.

  Note: Testing indicates that V2R1 will typically resolve addresses within three to five minutes, even under soft error conditions that prevent the Neighbor Notification process from completing. The R1Vx versions of the code could not resolve addresses under this condition.
- Several problems which resulted in MAC error codes (E7, 6D, etc.) have been corrected.
- There were no changes to the Maintenance Facility program.

8230 Microcode Version 2 Release 0 - Microcode File Identifier - 8230V2R0.BIN

- The '05' (8230 congestion) error is gone from the 8230. Previously, rings with more than 120 stations would see this error code because the 8230 could not process Neighbor Notification frames quickly enough. The code has been optimized and tested with up to 260 stations, and does not flash the '05' error at all.
- The configuration table algorithm matching 8230 ports to adapter addresses determines the pairing much quicker than before. Previously, the 8230 required two consecutive ring poll cycles without interruptions to add new stations to the table. This meant at least 14 seconds, but usually longer. On a ring with soft errors, stations would often not be placed in the table for several minutes, sometimes not at all. With the help of a new, smarter algorithm, stations will get into the table within 10 seconds, barring very high soft error rates. During high soft error conditions, the 8230 has a backup algorithm (similar to LAN Manager 'walking the ring') which is used to determine ring topology.
- The 8230 microcode is now capable of detecting lobe splitters (DTAUs, Mulligans, splices, or whatever name you prefer). It uses an algorithm which actively disables and re-enables ports in an attempt to locate each address on the 8230. While this operation may kill a token or two, there will be no effect on overall ring operation (the disabling/enabling of ports has the same effect as a new station inserting and switching a relay). A splitter will show up in the Maintenance Facility address field as 'MultiAdapter'. The Maintenance Facility user can select any 8230 port showing 'MultiAdapter' and see a list of the addresses on the port.
- The 8230 can also detect stations, such as IBM's Trace and Performance Tool and Network General's Sniffer, which do not participate in the Neighbor Notification process. The Maintenance Facility will report these lobes as containing a "Trace Tool".

  Note: These adapters will **not** be detected if they reside on a splitter being used by other active stations.

- Current levels of LAN Network Manager (LNM) will benefit from the address/port matching enhancements. In previous levels of code, the 8230 reported a configuration alarm when it identified an address/port mismatch. Thus, no stations which inserted after (in time) the mismatch were identified in the address/port configuration table. In the new code, this is no longer the case. LNM will not be able to display the addresses of any port containing multiple addresses or a trace tool (it will display '????????????' denoting an unresolved address), but it will be able to get the addresses of any stations which are alone on their respective ports; regardless of when they insert. This is a big improvement over previous code, where the LNM operator might see '????????????' all over the place even though only a single mismatch has occurred.

- The 8230 can now be configured to use a Locally Administered Address (LAA). When downloading code via Maintenance Facility, the user may select to use the Universally Administered Address, or a Locally Administered Address of his choosing. Only the PO Address is selectable; PI and S will use the next 2 sequential addresses, respectively. If the 8230 is already using a LAA, the user is also given the option of using the current LAA.

- The 8230 currently allows a lobe to fail insertion 7 times before the lobe is permanently disabled (requiring LNM or Maintenance Facility to re-enable it). This "removal threshold" value can now be set from Maintenance Facility while the CAU is running. Any value from 1-99 can be set (a "0" is treated as a "1"). A 'failure count' for each lobe is incremented when that lobe is removed because of a beacon error (e.g., wrong speed adapters). It is reset to zero when a station address is successfully inserted into the topology table for that lobe. If the count equals the removal threshold, that lobe is disabled.

- Currently, the 8230 will remove a LAM with a 2x or 3x error when any bit error is detected on the connecting control cable. Since the 'error' could be caused by the bit error rate of the cable connecting the LAM to the CAU, the LAM error detection routines have been changed to correct the occasional bit errors in the cable so they will cause no functional problems. Persistent failures will still cause LAM errors. This should result in fewer LAM error indications.

- All reported F8 and 6D errors have had causes identified and all causes have been fixed. Also, some other errors which would not be evident to an 8230 user have been fixed.

- Though all known F8 errors have been fixed, it is still possible that an 8230 will suffer a program error. The microcode has been changed so that any F8 error will cause the 8230 to automatically reset itself and notify LMN once it is reset.

  Note: The reset performed after an F8 error is abbreviated. It will take approximately 10 seconds before normal network operation is restored. This should prevent loss of session on most network connections. However, this is the equivalent of a 'soft reset' from LNM and will result in the loss of configuration data such as disabled ports and will also reset the 8230 password to the default. This information must be refreshed from LNM or Maintenance Facility to return the 8230 to its pre-error condition.

- Maintenance Facility, of course, has been upgraded to support the new 8230 microcode, including address/port matching enhancements, LAA support, and the threshold counter setting.

- Maintenance Facility has been sped up by changing some of its timers. The difference has not been measured, but is noticeable in a side-by-side comparison.

- Maintenance Facility has added an ”Auto-Down-load” feature, which allows a user to down-load every 8230 on a given ring with one command instead of doing each one individually. This function is started with the F8 key from the main menu.
- Maintenance Facility help screens have been updated to cover the address/port matching enhancements, LAA support, threshold counter setting, and auto-down-load.
- Maintenance Facility now has the capability of ”seeing” 8230s which are already registered with an LNM. Maintenance Facility will be able to get status information (topology, error codes, etc.) from all 8230s, but will not be able to issue commands (disable port, down-load code, etc.) to any 8230 that is registered.
- Maintenance Facility will display the address of the station with which any 8230 is registered.
- Maintenance Facility can down-load code from anywhere (not just the A: drive). Enter the complete path name to be used (up to 39 characters), and Maintenance Facility will find the file.
- Maintenance Facility has undergone some screen changes to make it easier to use. The most evident example of this is the ability to press the F10 key (Display List of LAM Addresses) while selecting a LAM on the 8230 Details screen, instead of having to select the LAM Details screen first.
- Maintenance Facility now displays all three of the microcode EC levels in use in the 8230 (MAC EC level first, EPROM EC level second, FLASH EC level third).
- Maintenance Facility will display the total number of **addresses** active on the 8230 or the selected LAM. This may differ from the number of inserted ports.
- Maintenance Facility will display the 8230’s internal error code with the external error code. The internal code will be displayed in parentheses.