

To: MAB Distribution

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Subject: Procedures for Normal Installations

### Introduction

This bulletin outlines the procedures for submitting software for installation into the Multics System Libraries.

This MAB replaces MABs 004, 012, 013, 014, 015, 033, and 034. Refer to MAB-057 for a description of Procedures for Emergency Installation.

### MAKING THE CHANGES

All coding, testing, and auditing must conform to published Multics standards in affect at the time of coding, testing, and auditing.

### PURPOSE OF INSTALLATION

Installations are completed to provide bug fixes, new features, and/or enhancements to existing, or new, libraries. The ultimate goal of a single installation is inclusion in the distribution of a Multics Release to customer sites. A Multics Release is a hierarchical dump of the installed System M libraries in a stable condition.

### PREPARING FOR THE INSTALLATION

Several steps are involved in preparing an installation for submission.

1. **SUBMISSION DIRECTORIES:** Place all changed segments (e.g., source, bind file, info, etc.) in one, or more, installation directories. If several directories are used all source should be placed in one directory, all changed bind files, exec\_com, and ascii segments in another directory, all info segments in another directory, all include files in yet another directory. Fewer directories may be used with smaller installations by placing all types of segments in a single directory. In any given directory segments may be archived or unarchived. Refer to MAB-034

for further details.

2. MSCR: Prepare a Multics System Change Request (MSCR) as described in MAB-034. If the proposed change includes software previously installed as a Multics Emergency Change Request (MECR) include the MECR fix number on the first page of the MSCR form under the "Effect of Change" field. Refer to MAB-057 for a discussion of emergency fixes.
3. DOCUMENTATION: Attach to the MSCR a copy of all relevant approved MCRs, dprints of new or changed info segments, and manual writeups (if available). If the submission is an incompatible change, prepare a segment containing a notice to be placed in message\_of\_the\_day.info or in pending\_changes.info. Attach a dprint copy of the message text to the MSCR.

At this point preparations for submission are complete subject to successfully completing the checklist which appears as the last section of this MAB.

#### GETTING APPROVAL FOR THE INSTALLATION

Once the developer has been able to go through the checklist which appears on the last page of this MAB without identifying problems associated with the proposed installation it is time to gain approval signatures. There are several steps associated with gaining approval of a proposed submission.

4. SUBMITTOR'S APPROVAL: The submittor's signature verifies that all coding and testing has been in compliance with project plans and published standards in affect at the time of request for installation.
5. DOCUMENTATION APPROVAL: The signature of the Documentation Unit Manager, or designate, if applicable verifies that all associated documentation is in place, or has been provided to, the appropriate Documentation Unit (e.g., Phoenix or CISL).
6. AUDITOR'S APPROVAL: The auditor's signature verifies that all coding, testing, documentation, and auditing is in compliance with the approved MCR (including any amendments) and published standards in affect at the time of sign-off. The auditor should be someone knowledgeable in the area of the system being changed, but NOT a co-implementor having overly intimate knowledge of the code. The submittor must provide the auditor with the MSCR, MCR(s), documentation, and other relevant installation materials (e.g., cpa, listing(s), etc.) for review.

7. PROJECT APPROVAL: All MSCRs must carry the signature of the submitter's Unit Manager, or designate. This signature verifies the completeness and accuracy of the proposed installation.

#### SUBMITTING THE INSTALLATION

8. SUBMISSION: Send the MSCR (with the approval signatures defined above) and associated MCR(s) to the Project Leader, Phoenix System Integration Project. All associated segments must be available on System M with appropriate access. Access of s to containing directory(ies) and r to appropriate segments should be provided to \*.SysMaint.

#### PROCESSING THE INSTALLATION

9. INSTALLATION AT SYSTEM M: The System Integration Group installs the changes indicated on the approved MSCR form. If the change includes formal installation of an earlier MECR the MSCR should note under "D", Effect of Change, the assigned MECR number. The associated MECR entry is removed from the emergency installation tracking database following the successful installation of the MSCR.
10. INSTALLATION AT REMOTE DEVELOPMENT CENTERS (MIT, ACTC, CISL): When the MSCR has been installed on System M the Phoenix System Integration Project sends copies of the approved MSCR and associated documentation by packet or U.S. Postal Service. The coding change is forwarded using IMFT, tape, or other appropriate means to the remote Development Centers. The System Integration staff at the remote site then installs the change. If the change includes formal installation of an earlier MECR as indicated on the MSCR form by an MECR number under "D", Effect of Change, the associated MECR entry is removed from the remote Development Center's emergency installation tracking database. [NOTE: Installation at remote sites remains to be defined.]

#### POST-SUBMISSION BUG FIXES

Errors introduced in a program by the recent installation of an approved MSCR may be corrected without getting a new MCR. Such corrections are called post-submission bug fixes (PBFs). The following conditions must be met to submit a PBF change:

- the PBF may not introduce new or changed functionality. It may only correct an error, or errors, which were introduced by the change in the original MSCR.

- a new MSCR describing the PBF, an identifying the original MCR number, must be submitted to the Project Leader, Phoenix System Integration Project, within two (2) weeks of the original MSCR installation which introduced the error(s). The MSCR must indicate in Section "D", Summary or MECR number, that the proposed installation is a PBF. The new MSCR must have auditor and project approvals.
- critical problems, as defined in MAB-057, Revision 1, should be reported to the Project Leader, Phoenix System Integration Project, by Multics mail or telephone for special handling.

When the above conditions have been met the PBF may be installed by performing selected steps from those given above. The steps associated with a PBF are: coding, submission directory, MSCR, Auditor Approval, Project Approval, Submission, Installation on System M, Installation at Remote Development Centers.

#### MSCR FORM

At the same time this MAB is published a revised Multics System Change Request (MSCR) will be made available. The front of the MSCR form will have three lines located at the upper right corner. The top line will be "Change #" where the Phoenix System Integration Project may indicate a system change number to be used in tracking installations between System M and the remote Development Centers. The second line, "MR #", will reference the targeted release. The third line, "MCR #", will reference the approved MCR(s) associated with the submitted MSCR.

The remainder of the first page is deals with general circumstances of the MSCR and its approval for submission. Section "A" lists the available libraries (e.g., Hardcore, MCS, 355, OBS, Standard, Tools, and Unbundled). The submitter must use this section to identify which library, or libraries, are involved in the submission.

Section "B" requires the submitter to indicate whether the installation will provide a bug fix, improved performance, or new feature(s).

Section "C" requires that the submitter indicate whether the installation is or critical or normal priority.

Section "D" requires that the submitter provide a summary of the change. This summary is used to generate text for `online.changes.info` and `hardcore.changes.info`. If the proposed installation resolves and outstanding MECR, as described in MAB-057, the associated MECR number is provided as the first information in this section. If the installation is a PBF that

information must be the first item of information in this section.

Section "E" is to be used with Hardcore submissions only and requires that the submitter indicate whether there are changes to the header, bind files, error table, or gates.

Section "F" is to be used for special installation, or de-installation, instructions. An example would be where the proposed installation requires co-ordination between hardcore and online installation.

Section "G", Documentation Changes, must be used to indicate whether the installation will require changes to Multics manuals, info segments, message-of-the-day (MOTD), pending\_changes.info, or the Software Release Bulletin.

Sections "H" through "M" require various approval signatures as described above. Signatures of the Submitter, Auditor, Documentation group, and Unit Manager must be obtained prior to submitting the MSCR to the Project Leader, Phoenix System Integration Project.

Page 2 of the MSCR provides a detail sheet for the submission. Additional detail sheets are required for each bound segment involved. A single detail sheet may be used for all unbound segments involved. The detail sheet includes a line to indicate the Library where the reference bound or unbound segment is to be installed and sections "A" through "J" which provide information needed to properly install the submitted changes.

Section "A" requires that the submitter indicate whether the referenced segment is bound or unbound and whether there has been a bind file change. Line two of this section provides space for the submitter to provide the bound/unbound segments executable name (e.g., bound\_fscom2\_).

Section "B" requires a notation identifying the date and time source was copied from System M.

Sections "C" through "F" are to be used to provide the absolute pathname where segments referenced in Sections "G", "H", and "I" are to be copied from. The absolute pathname provided should be the shortest possible (e.g., >xl rather than >experimental). Where segments have been archived the name of the containing archive should be included in the pathname.

Section "G" must be used to indicate source and bind file segment names for bound segments and the action to be taken on those segments relative to the proposed installation. Acceptable actions and their symbols are: add the segment to the referenced bound segment, A; replace the segment in the referenced bound

segment, R; delete the segment from the referenced bound segment, R; and re-compile the referenced segment using changed include files provided with the proposed installation, \*. This section may also be used to identify source for unbound, exec\_com, or ascii segments.

Section "H" must be used to list include files and info segments that are to be added (A) to, replaced (R) in, or deleted (D) from, the libraries.

Section "I" must be used to indicate the adding (A) or deleting (D) of add\_names for unbound and info segments.

Section "J" is to be used for comments pertaining to that single detail sheet. An example would be where supplied info segments need to be installed in the subsystem utility hierarchy. Another example would be to inform the installer that the supplied source must be compiled using a changed include file listed on another detail sheet.

### MSCR CHECKLIST

The following checklist identifies problems most frequently encountered with installations and should be used by submitters, auditors, and Unit Managers to determine the integrity and completeness of proposed submissions.

- \_\_\_ Appropriate access of s to directories and r to segments for \*.SysMaint.
- \_\_\_ Include for recompiling all segments which use changed include files. All such segments must re-compile and execute error free. The peruse\_crossref (pcref) command must be used to guarantee that all segments are referenced in the MSCR.
- \_\_\_ Unbundled software may not reference unassociated PSPs.
- \_\_\_ All entry names must be placed on info and unbound segments.
- \_\_\_ All compiler installations must be capable of re-generating themselves using the newly installed compiler version.
- \_\_\_ MOTD and pending\_changes.info messages must be provided for incompatible changes.
- \_\_\_ Dependencies which are not yet installed must be documented.
- \_\_\_ Supplied segments must contain proper pnotices.
- \_\_\_ Supplied segments must contain proper system error message documentation as described in MTB-335.
- \_\_\_ Changed segments must contain historical notations documenting date changed, developer name, and the nature of the change.
- \_\_\_ MSCR form must be legible.
- \_\_\_ All segments referenced by the MSCR must be available on System M.
- \_\_\_ Verify that check\_mst runs without warning or error with

- \_\_\_\_\_ proposed hardcore changes.
- \_\_\_\_\_ Verify the correctness and legibility of all pathnames for submitted segments.
- \_\_\_\_\_ Verify that all special comments and instructions are complete.
- \_\_\_\_\_ Assure with a compare\_ascii (cpa) that the proposed installation does not back out interim installations.
- \_\_\_\_\_ Verify that all appropriate documentation, manual and info segments, are attached to the MSCR.
- \_\_\_\_\_ Attach the approved MCR with any associated amendments.
- \_\_\_\_\_ Standard library (e.g., Standard or Tools) software may not reference Priced Software Products (PSPs).
- \_\_\_\_\_ SRB notices must be provided for incompatible changes and new features.
- \_\_\_\_\_ Provide tested hardcore header changes and cpa when required.
- \_\_\_\_\_ Provide tested bind file changes and cpa.
- \_\_\_\_\_ Newly introduced free-standing segments have specific MCR Board approval.
- \_\_\_\_\_ Verify that the proposed installation will not introduce name duplications in the libraries.
- \_\_\_\_\_ Multiple archives must be sorted alphabetically and split alphabetically.