

X-CONTROL

USER MANUAL

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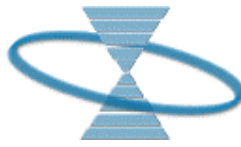
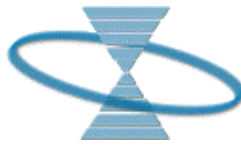


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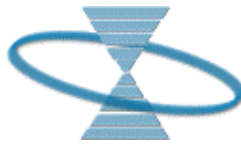


Module Summary

X-Control provides comprehensive facilities for change management at both the source and the object level. Project management facilities also allow the complete tracing and control of user change requests. Programming changes must be carried out in a controlled manner with only one programmer allowed to access the program/files under change at any one time. This change management system may be accessed directly from within X-Analysis or indirectly by invoking the change management command: X@PRJ.

Features include:

- Single command request for programmer changes.
- Optional pre-authorization for programmer changes.
- Parallel machine support.
- Interface to X-analysis for requests and returns.
- Related items review/request, including data dictionary fields.
- Automatic creation keyword command from maintainable defaults.
- Control of items returned to live systems by release, audit numbers or item level.
- Audit history from release to source line.
- Archive of source and/or objects.
- Integrity of data, logical over physical files, ownership, authority and journaling.
- Release preparation for tape or communications link.
- Interface to documentation in Office or Text files.
- Up to 9 library levels.



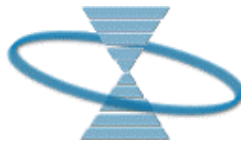
Introduction

X-Control allows the user to tailor the system to suit the needs of the business. The complete working environments from development to production may be defined. The definitions for each environment include:

- Source library
- Object library
- Object owner

The system promotes source and object in a controlled manner from development to production. If required, the previous version of the source and object may be copied to an archive library. Promotions may be made individually or grouped by an Audit number.

All dependent objects may be automatically re-created by Change Management. If a physical file is changed, the Where-Used feature of X-Analysis may be used to ascertain the names of dependent logical files and all programs, which reference the physical and logical files. Journaling will also be re-established. Physical file data and object authorities are also retained.



Users And Responsibilities

The system recognizes four different types of user and separate responsibilities may be assigned to each type. All user profiles in the Change Management system must be allocated to a user type.

- System Owner
- Project Manager
- Operator
- Programmer

System Owner

The System Owner will normally describe a project to Change Management. All objects created by the Change Management system will be owned by the System Owner, although the object owner can be changed for each environment in a project. Authority will be given to a number of Project Managers, who will control the daily activity for their projects.

Project Managers

Project Managers are responsible for their own individual projects. They define the authority given to a user to perform the various functions of Change Management.

Software change requests will normally enter the system via the Request Log. The Project Managers will review this log and allocate the various changes to programmers. An Audit number is allocated to each change.

The Project Manager may review which items are ready to be promoted to the next environment.

Operators

Operators schedule the promotion of source and objects to the next environment level.

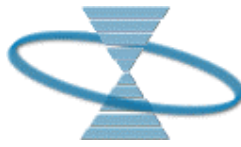
Programmers

Programmers make requests to change objects from the X-Analysis or Change Management systems. Source or objects are copied to the library names specified at the development level, unless a user source and/or object library has been defined.

Pre-compilation overrides may be specified by programmers. Default creation values may be changed.

Pre- and post-compilation command strings may also be added.

Reviews of requested objects may be performed and objects, which have been tested, may be flagged for future promotion.



Installation

Change Management is delivered on data cartridge, magnetic tape or diskette. The supplied media contains the following libraries:

X@MAN Object library
X@MAND Demonstration data library

Sign on to the system as the Security Officer (QSECOFR). Certain programs are owned by QSECOFR and use adopted authorities to implement requests. Public authority to the objects will be revoked if the QSECOFR user profile does not restore the library.

Command X@MAUTH may be used to correct the ownership if shipped incorrectly from Databorough.

Load The Media Containing The Change Management System

Restore the Change Management libraries using the RSTLIB (Restore Library) command. For a full description of the RSTLIB command, please refer to the IBM Control Language Reference manual.

To restore the X@MAN library, enter command RSTLIB on the Command Entry display and press <F4> to prompt the command. Select the following parameters:

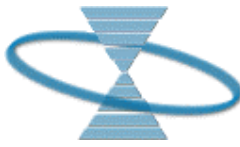
```
Restore Library (RSTLIB)

Type choices, press Enter.

Saved library . . . . . SAVLIB      > X@MAN
Device . . . . . DEV              > TAP01
                               + for more values
Volume identifier . . . . . VOL     > *MOUNTED
                               + for more values
Sequence number . . . . . SEQNBR   > *SEARCH
Label . . . . . LABEL             > *SAVLIB
End of tape option . . . . . ENDOPT > *LEAVE

...

```



To restore the X@MAND library, enter command RSTLIB on the Command Entry display and press <F4> to prompt the command. Select the following parameters:

```
Restore Library (RSTLIB)

Type choices, press Enter.

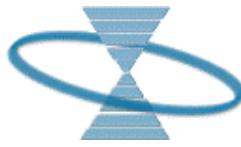
Saved library . . . . . SAVLIB      > X@MAND
Device . . . . . DEV              > TAP01
                               + for more values
Volume identifier . . . . . VOL      > *MOUNTED
                               + for more values
Sequence number . . . . . SEQNBR     > *SEARCH
Label . . . . . LABEL              > *SAVLIB
End of tape option . . . . . ENDOPT   > *REWIND

...

```

Library X@MAND contains the Change Management demonstration system. Customer data should not be added to files in the X@MAND library, as the library will be replaced by subsequent releases of the Change Management system.

The Create Object Management Data Library (CRTX@MAN) command should be used by the System Owner to create a customer database library. Please refer to the section 'Create Object Management Data Library'.



Create Change Management Data Library

The Create Change Management Data Library command creates a database library for use by the customer. To create the library, enter command CRTX@MAN on the command entry display and press <F4> to prompt the command.

Select the following parameters:

```

Create Object Management Data (CRTX@MAN)

Type choices, press Enter.

Library Name . . . . . LIB          > X@CTL
Text . . . . . TEXT          > 'Change Management'

From SOM Data Library Name . . . FROMLIB > X@MAND
SOM Object Library Name . . . . . MAN   > X@MAN
Authority List to secure files  AUTL    > *LIB
Allow separate Parameters? . . . PARM   > *NO

...

```

Enter the name of the library to be created, the library text and the name of the authorization list, which will secure the data files in the new library.

The Edit Authorization List command (EDTAUTL) will be automatically shown. This command allows the user to edit authority to the Authorization List.

For a full description of the EDTAUTL command, please refer to the IBM Control Language Reference Manual.

```

Edit Authorisation List

Object . . . . . : X@CTL          Owner . . . . . : QPGMR
Library . . . . . : QSYS

Type changes to current authorities, press Enter.

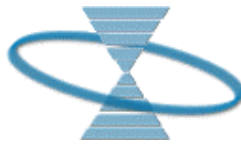
      Object      List
User   Authority  Mgt
QPGMR  *ALL       X
*PUBLIC *CHANGE

...

```

When the library has been successfully created, the Edit Object Authority command (EDTOBJAUT) will be automatically shown. This command allows the user to edit authority to the database library.

For a full description of the EDTOBJAUT command, please refer to the IBM Control Language Reference Manual.



```
                                Edit Object Authority
Object . . . . . : X@CTL          Object type . . . . . : *LIB
Library . . . . . : QSYS          Owner . . . . . : QPGMR

Type changes to current authorities, press Enter.

Object secured by authorisation list . . . . . *NONE

User      GROUP      Object
*GROUP    *ALL
*PUBLIC   *CHANGE
...

```

A record for the new database library will be added to the Change Management System file (X@SYS). The Work with System Descriptions program is executed to allow the user to view all existing records.

Press <F1> or <HELP> to see Help text for this screen.
Press <F3> to continue.

```
X-Control 5.2.7      Work with System descriptions      Databorough Ltd.
X@SYS                                                    11:23:42  8/10/94

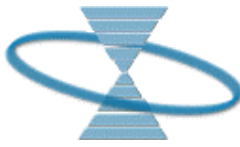
Position on:
Enter options, press Enter.
1=Add          2=Change          4=Delete          5=Display          6=Print
7=House-keep  8=Clear X@MANT

X-Control      X-Analysis  X-Control      System      Auth list      Act nbr
Data lib      Obj lib     Obj lib        Owner
X@CTL         X@OBJ       X@MAN          KAMAL_N    X@CTL
X@MAND        X@OBJ       X@MAN          M_TREGEAR          109
X@MANDXX      X@OBJ       X@MAN          S_TOVEY          9
X@MDTA        X@OBJ       X@MAN          H_KINGSLEY        659
X@SOM         X@OBJ       X@MAN          S_TOVEY    X@SOM          23146
...

```

The Create Object Management Data Library command is now complete. Projects must now be defined to the Change Management system, using the Work with Projects program.

Upon completion of the Create Object Management Data Library command, the Work with Projects is automatically invoked.



Project Definition

The Work with Projects screen is used to maintain definitions of Projects. New projects may be added; current projects may be changed or deleted. The program is called by any of the following options:

- Create Object Management Data Library command
- Executing the X@PRJ command to enter Change Management

Using action code 'O' on the X-Analysis Application screen and pressing F17.

If the project file contains no records, message 'No data found' will be displayed on the bottom line of the screen.

In the example below, a project named X@CTL is to be created. To add a new record to the project file, place a 1 in the entry field and press enter. Option 1 will not be shown if the user is not authorized to add records to the project file.

The ellipses (...) show that more options are available. Press <F23> to see additional options.

```
X-Control 5.2.7      Work with Project Descriptions      Databorough Ltd.
X@PRJ              All Projects              11:25:08  8/10/94
                                      X@CTL    WEYBRDG2

Position on:                Submit requests:  N

Type options, press Enter.
1=Add      2=Change      4=Delete      5=Display      6=Print
7=Audit    8=Environments  9=Send Release 10=Post Request 11=Rcv Release
12=Request Log 13=Users      14=Creations  15=Over-rides  ...

   Project      Description
   1
...

```

When the Update Project Descriptions program is called, the first screen to appear simply asks for the name of the project to be defined. The project name must not already exist.

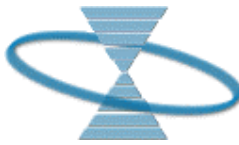
```
X-Control          Update Project Descriptions      Databorough Ltd.
X@PRJ1            11:26:55  8/10/94
                                      WEYBRDG2

Type choices, press enter to add record.

   Project . . . . . X@CTL
...

```

The second screen in the Update Project Description will now be displayed to allow the project details to be entered. In the bottom right hand corner of the screen, the word 'More' is shown. This informs you of further screens used to define the project. The ROLL keys may be used to view the next screen.



```
X-Control          Update Project Descriptions          Databorough Ltd.
X@PRJ1            11:26:55   8/10/94
                                     WEYBRDG2

Type choices, press enter to add record.

Project . . . . . : X@CTL

Project description . . . . . Control System
Environment limit . . . . . 3          2 - 8
Project manager . . . . . KAMAL_N     User profile
Release default . . . . . *NONE      F4 for list (if change)

Project control
Manager requests only . . . . . N          Y or N
Restrict creation . . . . . N          Y or N
Audit history . . . . . Y          Y or N
Rqs. after promotion . . . . . N          Y or N
Multiple requests . . . . . N          Y or N
Minimum request level . . . . . 0          2 - Environment limit
Object promotion . . . . . Y          Y or N
Status . . . . . A

F1=Help          F3=Exit          F5=Refresh          F6=Messages          More...
F24=More keys
```

Project Description

A description of the project.

Environment Limit

Enter the number of working environments you wish to use. To define a development, testing and production environment the value should be set to 3. Do not include the archive environment in this maximum.

Project Manager

The user profile of the Project Manager.

Release Default

This contains the default release number for requests. A record must be added to the release file using the Work with Release program before you specify the release default. If changing the record, F4 may be used to display a list of Releases.

Manager Requests Only

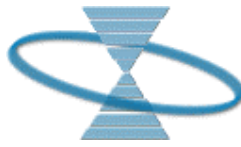
The Change Management system has the ability to allow Project Managers to assign source and objects to a programmer as part of the overall project plan. Control status records must be added with the Managers Request (X@MANRQS) command, this is available as option 11 on the Work with Creation Description screen, see below.

When the programmer makes the request for the source to be copied to development, the status of the Control Status record is changed to A indicating active. Programmers may only request items already requested for them by the manager.

- Enter Y to force the use of Manager Requests.
- Enter N to ignore this option.

Restrict Creation

Enter Y if you wish to stop object creation parameters from being changed by programmers or N to allow them to make changes to the parameters. Use the Work with Creations program to change these records.

**Audit History**

The Change Management system has the optional facility to keep a history of requests, returns and promotions. Enter Y to generate history information or N to ignore the history.

Requests Post Promotion

If set to Y, the users may make further requests against an Audit or Release number, even though at least one object has been promoted to the next environment. Enter N to force a new Audit number to be used for subsequent requests.

Multiple Requests

Change Management supports multiple copies of a source provided they are at different environment levels. Enter Y to support multiple copies of a source or N to ensure that a source must be promoted to the production environment before further requests of the source can be made.

Minimum Request Level

This is used in conjunction with the Multiple Request option. It informs the Change Management system of the lowest environment level at which it should be searching for source. If Multiple requests are supported, this value should be set at 2.

Example: If a project has been defined with 4 environment levels and the lowest environment is set to 2, this will allow a source to be requested from level 2 (if found), level 3 (if found) or level 4.

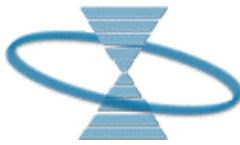
Object Promotion

The Change Management system allows source to be promoted individually or groups sets of related items under an Audit number. If the Object Promotion is set to Y, objects may be promoted individually from the Work with Status program. Setting the value to N means that objects will be promoted as a group from the Work with Audit program.

Status

Signifies the current status of the project. Will normally be set to A - active. Valid status codes are:

- A - active
- C - complete
- D - deleted
- I - Object Management implementation in progress
- P - details pre-entered
- S - suspended



```
X-Control          Update Project Descriptions          Databorough Ltd.
X@PRJ1                               11:26:55   8/10/94
                                         WEYBRDG2

Type choices, press enter to add record.

Automatic Release
Release envnmnt level      4          2 - Environment limit
Release library name .    *ADT          Library, *ADT or *RLS
Release objects . . . .   Y          Y or N
Release source . . . .   Y          Y or N
Release dependent pgm?    N          Y or N
Send User Id/Address .    CELIAR      F4 for list
                               WEYBRDG2

Release Directory . . . .

More...
F1=Help          F3=Exit          F5=Refresh          F6=Messages          F24=More keys
Release Environment Level must be between 1 and 3 if Auto Release is Y.
```

Release Environment Level

Used in conjunction with Automatic Release to define the environment number at which items are added to the release library. Cannot be entered, if Automatic Release is set to N.

Release Library Name

Enter the name of the release library. Cannot be entered, if the Automatic Release option is set to N. Change Management checks for the existence of this library. If the library does not exist, the Create Library command (CRTLIB) is automatically prompted.

For a full description of the CRTLIB command, please refer to the IBM Control Language Reference manual. The release library may be entered for the Project or the special values *RLS or *ADT (to use the Release or Audit id as the library) may be used.

Enter N or leave as blank to ignore this feature.

Release Objects

If objects are to be placed into the release library, enter Y. A value of N should be used if objects are not required.

Release Source

If source is to be placed into the release library, enter Y. A value of N should be used, if source is not required.

Project User ID/Address

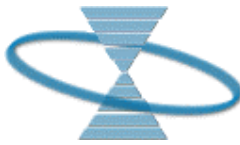
The project user id and address is used by SNADS to distribute objects to remote systems. An entry for the User ID and Address should be added to the IBM System directory.

When the project record has been generated, the Generate Project Data program is called. The program offers a short-cut solution to setting up records relating to the number of environments specified on the project record. The values can be changed at a later stage, if required.

Please refer to the project pro-forma document.

Release Directory

Enter the path of the directory to which all *STMF objects will be copied for distribution. If this field is left blank, *STMF objects will not be distributed by release management.



```
X-Control          Update Project Descriptions          Databorough Ltd.
X@PRJ1           11:26:55    8/10/94
                                     WEYBRDG2

Type choices, press enter to add record.

Cross project details
Master project . . . .    Y          Y=Yes, D=Database or N=No
Sub-project of . . . .
Switch environment . .    2 - Environment limit
Allow master requests    N          Y or N
Allow master promotes    N          Y or N
Allow master creations    N          Y or N

                                     Bottom

F1=Help          F3=Exit          F5=Refresh          F6=Messages          F24=More keys
```

Master Project

- Enter Y if this is a Master project, which may process dependent items from other projects that allow Cross-project requests, creates or promotes. Any related items requested, are kept in their original Projects.
- Enter D if this is a Database master project, which may process dependent items from projects that are described as Sub-projects of this project. Any related items requested, are placed into the Master project.
- Enter N otherwise.

For more details see related items on the Request command.

Sub-Project Of

Enter the Master project if this is a Sub-project. Otherwise, leave blank.

To use this feature, one Project must be defined as a Database master project. Sub-projects may then have programs requested by this Master project. When a file is requested by the master project, any related programs are also requested from any project with a matching Sub-project. The programs are then controlled by the Master project. They will be returned, during promotion to this project at the Switch environment.

Requests may also be made to items from the Sub-project in the normal way.

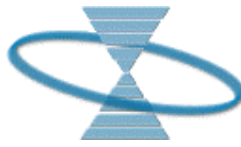
For more details see related items on the Request command.

Switch Environment

Enter the required Switch environment.

If the Project is not a Sub-project of a Database master project, this must be zero. When items requested from the project by a Master project are Promoted, they will be returned to this project at the Switch environment. Items that are Requested to a project and its Master project must be Promoted beyond the switch environment, before the Sub-project item may be promoted as far as the Switch environment. An error message will be issued if an attempt is made to Promote a Sub-project item also requested by the Master project.

For more details about Master projects, see related items on the Request command.

**Allow Master Requests**

- Enter Y if Requests for items in this project may be made from the Master project.
- Enter N if Requests for items in this project must be made from this Project only.

For more details about Master projects, see related items on the Request command.

Allow Master Promotes

- Enter Y if Promotions from a Master project may re-create related items in this project.
- Enter N if Promotions may not re-create related items.

For more details about Master projects, see related items on the Request command.

Allow Master Creations

- Enter Y if Creations from a Master project may re-create related items in this project.
- Enter N if Creations may not re-create related items.

For more details about Master projects, see related items on the Request command.

Generate Project Data

Records are displayed for each environment requested, plus a record for 9 - archive.

```
X-Control          Generate Project Data          Databorough Ltd.
X@GPRJ              11:36:29  8/10/94

Project name . . . . : X@CTL      Control System

Copy Users from project
Copy Doc Dfts project .

Env  Source Library  Object Library  Data Library  Obj Owner  Test
1   CTDEVSRG        CTDEVOBJ       CTDEVDTA     QPGMR      N
2   CTTSTSRC        CTTSTOBJ       CTTSTDTA     QPGMR      N
3   CTQUASRC        CTQUAOBJ       CTQUADTA     QPGMR
9   #X@CTL          #X@CTL         #X@CTL       PRDPGMR
...

```

Copy Users from Project

If you wish to have the same Users enrolled in this project as on an existing project, enter that existing project.

Copy Doc Dfts Project

If you wish to have the same Document Defaults for this project as on an existing project, enter that existing project.

Source Library

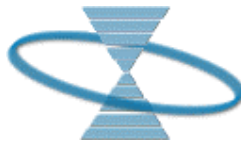
Enter the name of the source library for each environment.

Object Library

This defines the name of the library into which all objects excluding database files are to be placed.

Data Library

The name of the library into which database files will be compiled or promoted. Database files are considered to be object type *FILE with an attribute of FRF, PF, PF38, LF or LF38.



Object Owner

Enter the user profile that will own objects at each environment. The System Owner will own the objects if this are left blank.

Test

Enter Y if all items must be flagged as tested before they may be promoted.
Enter N if this check is not required.

Environment 9

If you wish to archive production source and objects before they are replaced by new versions, enter the library names for environment 9. Leave the fields blank if you do not wish to archive production source and objects.

Change Management checks for the existence of each library specified on the Generate Project Data screen. If any of the libraries does not exist, the Create Library command (CRTLIB) is automatically prompted. For a full description of the CRTLIB command, please refer to the IBM Control Language Reference manual.

```

                                Create Library (CRTLIB)

Type choices, press Enter.

Library . . . . . LIB                > CTDEVSRC
Library type . . . . . TYPE           > *PROD
Text 'description' . . . . . TEXT     > 'X@CTL Development Source library

...

```

Change Management checks for the existence of each user profile specified on the Generate Project Data screen. If any of the user profiles does not exist, the Create User Profile command (CRTUSRPRF) is automatically prompted. For a full description of the CRTUSRPRF command, please refer to the IBM Control Language Reference manual.

```

                                Create User Profile (CRTUSRPRF)

Type choices, press Enter.

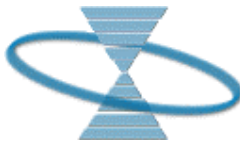
User profile . . . . . USRPRF        > PRDPGMR
User password . . . . . PASSWORD     > *USRPRF
Set password to expired . . . . . PWDEXP > *NO
Status . . . . . STATUS              > *ENABLED
User class . . . . . USRCLS          > *USER
Assistance level . . . . . ASTLVL    > *SYSVAL
Current library . . . . . CURLIB     > *CRTDFT
Initial program to call . . . . . INLPGM > *NONE
  Library . . . . .
Initial menu . . . . . INLMNU        > MAIN
  Library . . . . .                  > *LIBL
Limit capabilities . . . . . LMTCPB   > *NO
Text 'description' . . . . . TEXT    > 'X@CTL Archive Owner'

                                Bottom

F3=Exit   F4=Prompt   F5=Refresh   F10=Additional parameters   F12=Cancel
F13=How to use this display   F24=More keys

```

If the 'Add FRF on Projects' parameter is set to 'Y' (see Parameter Maintenance, below), the Work with Creation is the next program to be called. You will be asked to define the names of your field



reference file(s). Records are written to the Creation Description file (X@CRT) with a special attribute of FRF - signifying a Field Reference file.

```

X-Control          Work with Creation Descriptions      Databorough Ltd.
X@CRT             by Object name                       12:06:50   8/10/94
                                                         WEYBRDG2

Master:           X@CTL          Control System
To Project:       Submit: N      Man rqs User:
Position on:      Rqs Defaults:

Enter options, press Enter.
1=Add             2=Change        4=Delete          5=Display          6=Print
7=Add entries    8=Request          10=Create parms  11=Manager rqs ...

   Object      Type      Attributes   Spl Pre Text

F1=Help          F3=Exit          F4=Prompt      F6=Refresh       F24=More keys
No Data Found.

```

This step is extremely important as compilations and promotions within Change Management are performed in a the following specific order:

- Field Reference files
- Physical files
- Logical files
- Display and Printer files
- Programs

The Creation Sequence file X@CTS describes the sequence in which compilations and promotions are performed. Work with Creation Descriptions is fully described later in the manual.

If the 'X@ROBJD on Projects' parameter is set to 'Y', (see Parameter Maintenance, below), the X@ROBJD command is automatically prompted for each of your Production libraries.

This command loads the names of all production objects to the Creation Description file (object name, type, attribute and text etc.). Field reference files, which have been described, will still retain an attribute of FRF.

If required, the command may be run by using pressing <F15>, on the Work with Creation Descriptions program.

Retrieve Object Descriptions (X@ROBJD)

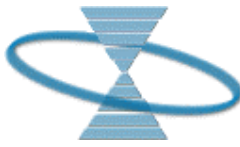
```

Retrieve Object Descriptions (X@ROBJD)

Type choices, press Enter.

Object name . . . . . OBJ          > *ALL
Library . . . . .                  > CTPRDDTA
Object Type . . . . . OBTP         > *ALL
Object Attribute . . . . . OBAT    > *ALL
Project . . . . . PRJ              > X@CTL
Split id for Creation record . . SPLIT
Add or Replace . . . . . ADDRPL    *REPLACE
Retrieve detail attributes? . . . . . *YES
Extract RPG Auto Report Source . . IDTRPT *YES
...

```

**Object**

The names of the objects to be processed by the X@ROBJD command, qualified by object library.

Object Type

Specifies the object types, which are to be processed.

Object Attribute

The object attributes, which are to be processed.

Project

Specifies the name of your project.

Add/Replace

Allows records to be added or replaced in the Creation Description file.

Auto Report

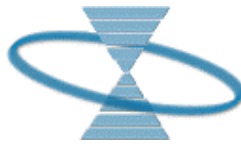
Enter Y if your company uses Auto Report to compile RPG programs. The option processes the production source library, searching for source members with an attribute of RPT or RPT38. Change Management will now present you with the Work with Users, Work with Release descriptions and Work with Document Defaults screens in turn.

Entries may be made for these files and for Audit ids, which is reached by using option 7 on the Work with Release descriptions screen.

Release Descriptions (X@RLS)

Work with Release Description is the next program to be called. Items that are changed within Change Management are grouped by Audit within Release. X@RLS command maintains Release details. Work with Release Descriptions is fully described later in the manual.

X-Control	Release Descriptions	Databorough Ltd.
X@RLS		10:26:20 26/10/94
		WEYBRDG2
Master:	X@CTL	Control System
Position on:		Submit requests: N
Type options, press Enter.		
1=Add	2=Change	3=Create
4=Delete	5=Display	
6=Print	7=Audit	8=Audit env.
11=Documents	...	
Release	Description	Env Sts Pty
*NONE	Un-assigned Audit items	A
F1=Help	F3=Exit	F5=Refresh
F6=Messages	F24=More keys	



User Descriptions (X@USR)

Work with User Description is the next program to be called. X@USR Command is used to enroll users. Work with User Descriptions is described below in the manual.

```
X-Control          Work with User Descriptions          Databorough Ltd.
X@USR                                                     10:17:53  26/10/94
                                                         WEYBRDG2

Master:           X@CTL          Control System
Position on:

Enter options, press Enter.
1=Add            2=Change          4=Delete          5=Display          6=Print
7=Object libs   8=Defaults          9=Authority       10=Pgm seqs       ...

      User          Type  Request  Except  Return  Max  Sts
*OPER          O    N                N        3    A  Operator
*PGMR          P    Y                Y        0    A  Programmer
*PRJMAN        M    N                N        0    A  Project Manager
*SYSOWN        S    N                N        0    A  System Owner

F1=Help          F3=Exit          F5=Refresh        F6=Messages        F24=More keys
```

Document Defaults (X@DCD)

The Work with Document Default is the next program to be prompted. X@DCD Command is used maintain Documents. Work with Document Default is described later in the manual.

```
X-Control          Work with Document Defaults          Databorough Ltd.
X@DCD                                                     10:38:08  26/10/94
                                                         WEYBRDG2

Master:           X@CTL          Control System
Position on:

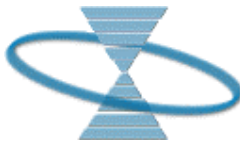
Enter options, press Enter.
1=Add            2=Change          4=Delete          5=Display          6=Print

      Type          Doc type  Media  Ext  Source file/library or Folder
X@ADT          T                T                *LIBL/QTXTSRC
X@LOG          T                T                *LIBL/QTXTSRC
X@RLS          T                T                *LIBL/QTXTSRC
X@STS          *FILE          T                *LIBL/QTXTSRC
X@STS          *PGM           T                *LIBL/QTXTSRC
X@USER        T                T                *LIBL/QTXTSRC

F1=Help          F3=Exit          F5=Refresh        F6=Messages        F24=More keys
```

We have now completed the definition of a project and records have been automatically loaded to the Environment file (X@ENV), Object Library (X@OLB) and the Creation Description file (X@CRT).

The Update Project Description screen will appear, allowing you to define further projects if required. If you have finished defining projects, press <F3> to return to the Work with Projects program.



Your project will appear on the screen.

```

X-Control          Update Project Descriptions          Databorough Ltd.
X@PRJ1            11:26:55      8/10/94
                                     WEYBRDG2

Type choices, press enter to add record.

Project . . . . .

F1=Help          F3=Exit          F5=Refresh          F6=Messages          F24=More keys
Record has been created. Please enter another record or F3=Exit.
Bottom

```

Press <F3> from the Work with Projects program.

```

X-Control 5.2.7    Work with Project Descriptions      Databorough Ltd.
X@PRJ            All Projects                          12:06:50      8/10/94
                                     X@CTL        WEYBRDG2

Position on:          Submit requests: N

Type options, press Enter.
1=Add                2=Change          4=Delete          5=Display          6=Print
7=Audit              8=Environments    9=Send Release    10=Post Request    11=Rcv Release
12=Request Log       13=Users          14=Creations      15=Over-rides     ...

Project              Description
X@CTL                Control System

F1=Help          F3=Exit          F4=Prompt          F6=Refresh          F24=More keys

```

Retrieve Source Descriptions (X@RSRCD)

If you have Text source or any other source that does not have an associated object, you may wish to use the Retrieve Source Description (X@RSRCD) command. This command loads the names of all source members to the Creation Description file (object name, type, attribute and text etc.).

These items will be loaded as type *NONE attribute TXT as a default. Additional source item types may be added for a Project as required, see Work with Default Descriptions below.

This command may also be executed by pressing <F17>, on the Work with Creation Description screen (X@CRT).

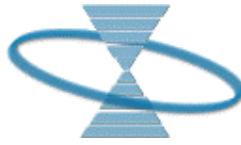
```

Retrieve source descriptions (X@RSRCD)

Type choices, press Enter.

Source file . . . . . OBJ          > *ALL
Library . . . . .                > CTPRDDTA
Assign to object type . . . . . OBTP > *all
Assign to attribute type . . . . . OBAT > *ALL
Project . . . . . PRJ             > X@CTL
...

```



Source File

The names of the source file to be processed by the command, qualified by source library.

Object Type

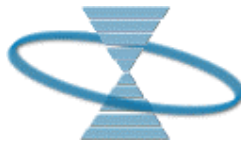
Specifies the object types, which are to be assigned.

Object Attribute

The object attributes, which are to be processed.

Project

Specifies the name of your project.



Create Sequences

The X@CTS file describes the sequence in which objects will be created when an Audit or Release level promotion takes place. A default value of *ALL and sequence 9, will be maintained. Only the System Owner should have access to this file.

```
X-Control 5.2.7      Work with Creation Sequences      Databorough Ltd.
X@CTS              10:38:08 26/10/94

Position on:
Enter options, press Enter.
1=Add              2=Change              4=Delete              5=Display              6=Print

Type      Attributes      Crt seq
*CMD                      8
*DOC                      5
*DTAARA                    5
*DTAQ                     6
*FILE      *ALL          5
*FILE      FRF           1
*FILE      LF            3
*FILE      LFM           3
*FILE      LF38          3
*FILE      PF            2
*FILE      PFM           2
*FILE      PF38          2
+

F1=Help      F3=Exit      F5=Refresh      F6=Messages      F24=More keys
```

Options:

1= Add

Use this option to add more records to the file. A message will be displayed if you do not have the necessary authority.

2=Change

Use this option to change existing records. A message will be displayed if you do not have the necessary authority.

4=Delete

Use this option to delete a record from the file. A message will be displayed if you do not have the necessary authority.

5=Display

Use this option to display the data in an existing record.

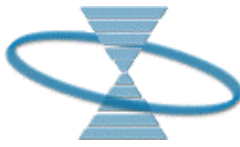
6=Print

Use this option to print the data from an existing record.

Object type

Enter the object type for the item.

The object types are the same as those used by IBM. *FILE, *PGM etc.; the source-only object type *NOOBJ is also allowed for Text and Format Data, etc.



The IBM default object types are generated by the Load Document Defaults (X@LDCD) command and copied to a Project using the Copy Document Defaults (X@CPYDCD) command.

Attribute

Enter the object attribute for the item.

IBM attributes such as RPG, CLP etc are used. Users can add their own, unique, attributes via the Work with Default Creation display.

An additional attribute is FRF for Field Reference Files.

Databorough Function Keys

Each display supports a set of function keys that allow you to perform specific tasks. Usually, the keys are listed at the bottom of the display. The function keys may always be used, even if they are not displayed.

F1=Help

Press F1 to see Help Text for this display.

F3=Exit

Press F3 to leave this display.

F5=Refresh

Press F5 to refresh this display with up-to-date data.

F6=Messages

Press F6 to display any User messages.

F12=Cancel

Press F12 to cancel the current display.

F13=Fast exit

Press F13 to leave the current display and a number of previous displays.

F14=Wrk sbmjob

Press F14 to Work with Submitted Job (WRKSBMJOB).

F16=Print all

Press F16 to print all records in this file.

F21=Wrkoutq

Press F21 to work with X-Analysis output queue reports.

F22=Utilities

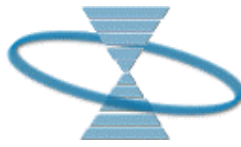
Press F22 to display the X-Analysis Utilities menu.

F23=More options

Press F23 to display more options.

F24=More keys

Press F24 to display more function keys.



Users

Before the Change Management system may be used, we must use the Work with Users screen to enroll users. The program is called by entering option 13 against a project.

If the file contains no records, message 'No data found' will be displayed on the bottom line of the screen. In the example below, a user with User profile K_THOMAS is to be added to project X@CTL. To add a new record to the file, place a 1 in the entry field and press enter.

```
X-Control          Work with User Descriptions          Databorough Ltd.
X@USR              10:17:53  26/10/94
                   WEYBRDG2

Master:           X@CTL          Control System
Position on:
Enter options, press Enter.
1=Add            2=Change          4=Delete          5=Display          6=Print
7=Object libs   8=Defaults          9=Authority       10=Pgm seqs       ...

   User          Type Request Except Return Max Sts
*OPER           O    N           N           3    A  Operator
*PGMR           P    Y           Y           0    A  Programmer
*PRJMAN         M    N           N           0    A  Project Manager
*SYSOWN         S    N           N           0    A  System Owner
...

```

The second screen requests the User Profile and User type. Press <F4> to see a list of User profiles defined on the iSeries.

```
X-Control          Update User Descriptions          Databorough Ltd.
X@USR1            10:17:43  26/10/94
                   WEYBRDG2

Type choices, press enter to add record.

Project . . . . . : X@CTL
User profile . . . . . KAMALN_N          F4 for list
User type . . . . . P
...

```

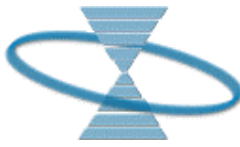
User Profile

Enter the User profile that the person has on the iSeries. Group profiles may not be used. The special values, *OPER, *PGMR, *PRJMAN and *SYSOWN may also be used. A user may appear only once for any one project, but may be enrolled on more than one project.

User Type

Enter the user type:

- P Programmer
- M Project manager
- O Operator
- S System owner



If additional user types have been entered, these may also be used. When the user type is valid, the default values for that type will be presented on the next screen. The default values act as a model. To maintain separation of responsibility, use these default values.

```
X-Control          Update User Descriptions          Databorough Ltd.
X@USR1            10:17:43  26/10/94
                                     WEYBRDG2

Type choices, press enter to add record.

Project . . . . . : X@CTL
User profile . . . : KAMAL_N          Kamal Narang
User type . . . . . : P              Programmer
Request rights . . . : Y
Request exception . . : N              E=Exception only, V=Version only
                                     Y=Exception and Version or N=No

Return rights . . . . : Y
Max promotion level .
Status . . . . . : A

...

```

Request Rights

Enter Y, if the user may make requests to change or add objects using this project.
Enter N, if the user may not make requests.

Request Exception

Enter Y, if the user may make exception requests to change or add objects using this project. See Requests, Returns and Creation, for more details about request types.
Enter N, if the user may not make exception requests.

Return Rights

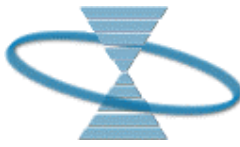
Enter Y, if the user may flag requested items as returnable. Only items flagged as returnable may be promoted. Return does not change the location of source or objects.
Enter N, if the user may not make returns.

Max Promotion Level

Enter the maximum environment to which this user may promote items. Enter zero, if the user should not have any promotion rights.

Status

Enter A to make the user Active. Enter S to suspend the user without deleting the record.
Only active users have any rights to a project.



Releases And Audits

Items that are changed within Change Management are grouped by Audit within Release. X-Control also provides a *NONE Release for users that do not need this level of grouping. All requests must be made to a Release and Audit. Once Release and Audit details have been added, they may also be used as default values.

The Project may have a default Release and each Release may have a default Audit. The Request command will default to these values if found.

Additionally, Users may add a default Release and Audit to their individual User Default record. The Request command will use these values before the Project/Release defaults if found.

To maintain Release details use option 24 from the Work with Projects screen. In the example below, a release of V2R1M1 is to be added to project X@CTL. To add a new record to the file, place a 1 in the entry field and press enter.

```
X-Control          Release Descriptions          Databorough Ltd.
X@RLS              10:26:20  26/10/94
                                WEYBRDG2

Master:           X@CTL          Control System
Position on:      Submit requests: N

Type options, press Enter.
1=Add             2=Change             3=Create             4=Delete             5=Display
6=Print           7=Audit              8=Audit env.       11=Documents       ...

   Release      Description                               Env  Sts  Pty
1  *NONE        Un-assigned Audit items                               A

...

```

The second screen requests a Release be entered.

```
X-Control          Update Release Descriptions          Databorough Ltd.
X@RLS1            10:26:58  26/10/94
                                WEYBRDG2

Type choices, press enter to add record.

Project . . . . . : X@CTL
Release . . . . . : V2R1M1

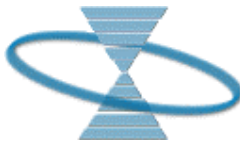
...

```

Release

Any value that does not already exist may be entered. Please note that when using the Documentation option, IBM names (alpha leading character followed by alphanumeric characters) will give a direct connection to Text members and Documents.

To add the release, enter the details below.



```
X-Control          Update Release Descriptions          Databorough Ltd.
X@RLS1            10:26:58  26/10/94
                  WEYBRDG2

Type choices, press enter to add record.

Project . . . . . : X@CTL
Release . . . . . : V2R1M1
Release description . Ver 2 rel 3
Priority . . . . .
Default Audit name . . *SELECT      F4 for list (if change)
Release date . . . . . 0/00/00
Environment . . . . .
Status . . . . .      A

...

```

Release description

Enter a description of the release.

Priority

A priority may be entered.

Default Audit Name

Enter the Audit name, which will act as the default for the release. The Audit must already exist.

Release Date

A release date may be entered.

Status

- Enter A for an Active release.
- Enter C for a Completed release.

This value will be automatically set to C when all items in the release have been promoted to the Production environment.

Adding Audit Names

To maintain Audit details use option 7 from the Work with Release descriptions screen or to use the *NONE Release use option 7 from the Work with Projects screen.

In the example below. An Audit of XA0020 is to be added to release V2R1M1 in project X@CTL. To add a new record to the file, place a 1 in the entry field and press enter.

```
X-Control          Work with Audit File          Databorough Ltd.
X@ADT            Audit within Project/Release          10:31:31  26/10/94
                  WEYBRDG2

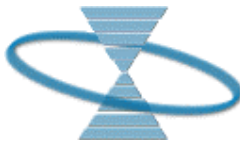
Master:          X@CTL          *NONE          Un-assigned Audit items
Position on:          Submit requests: N          To Release:

Type options, press Enter.
1=Add          2=Change          3=Create          4=Delete          5=Display
6=Print          7=Status          8=Adt-prq          9=Request log          ...

  Audit          Description          Assignee          Sts          Pty
1  A0000001          Default Audit, delete if not required          A

...

```



The second screen requests an Audit name to be entered.

If the 'Generate New Audit' value for the Project has been set to Y, the next available Audit id across the Project will be presented to you to confirm or change as required.

```
X-Control          Update Audit File          Databorough Ltd.
X@ADT1            10:32:41  26/10/94
                                     WEYBRDG2

Type choices, press enter to add record.

Project . . . . . : X@CTL      Control System
Release . . . . . : *NONE     Un-assigned Audit items
Audit id . . . . . : A0000002

...

```

Audit

Any value that does not already exist may be entered.

Please note that when using the Documentation option IBM names (alpha leading character followed by alphanumeric characters) will give a direct connection to Text members and Documents. To add an Audit enter the details below.

```
X-Control          Update Audit File          Databorough Ltd.
X@ADT1            10:32:41  26/10/94
                                     WEYBRDG2

Type choices, press enter to add record.

Project . . . . . : X@CTL      Control System
Release . . . . . : *NONE     Un-assigned Audit items
Audit id . . . . . : A0000002
Audit name . . . . : Add install release option to Projects
Priority . . . . . : 1         0 - 9

Due by date . . . . . : 0/00/00
Estimated man-days . .
Actual man-days . . .
Tested . . . . . : N         Y or N
Status . . . . . : A
Exception request . . : N         E=Exception, V=Version or N=Normal
Comment . . . . .

F1=Help          F2=Document      F3=Exit          F5=Refresh      More...
F24=More keys

```

Audit Name

Enter a description of the audit.

Priority

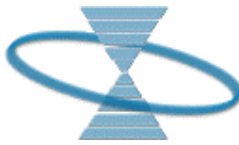
A priority may be entered.

Assignee

This value will be maintained by the system.

Due by Date

A Due by date may be entered.

**Estimated Man-Days**

The estimated man-days may be entered.

Actual Man-Days

The actual man-days may be entered.

Tested

Enter Y if the audit has completed testing.

Status

- Enter A for an Active audit.
- Enter C for a Completed audit.

This value will be automatically set to C when all items in the audit have been promoted to the Production environment.

Exception Request

- Enter Y if the Audit may be used for Exception requests, see Requests, below.
- Enter N otherwise.

Comment

Enter up to 256 characters of comment. To enter more text use the option 11, Documents. The roll keys may be used to enter additional details.

X-Control	Update Audit File	Databorough Ltd.
X@ADT1		10:32:41 26/10/94
		WEYBRDG2
Type choices, press enter to add record.		
Requested by Id . . .	KAMAL_N	
Requested by date . .	26/10/94	
Approved by		
Approved date	0/00/00	
Environment		
...		

Requested by Id

Enter the user requesting the audit or leave blank.

Requested by Date

Enter the date requested by or leave as zero.

Approved by Id

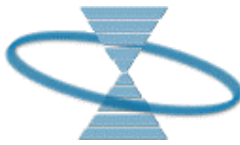
Enter user approving the audit or leave blank.

Approved by Date

Enter the date approved by or leave as zero.

Environment

The system will maintain this value.



Adding Document Defaults

To maintain Document defaults use option 20 from the Work with Projects screen.

In the example below, a Document default is added to project X@CTL. To add a new record to the file, place a 1 in the entry field and press enter.

```

X-Control          Work with Document Defaults          Databorough Ltd.
X@DCD              10:38:08  26/10/94
                                      WEYBRDG2

Master:           X@CTL          Control System
Position on:
Enter options, press Enter.
1=Add            2=Change          4=Delete          5=Display          6=Print

   Type          Doc type      Media  Ext  Source file/library or Folder
X@ADT
X@LOG
X@RLS
X@STS          *FILE      T      *LIBL/QTXTSRC
1 X@STS          *PGM      T      *LIBL/QTXTSRC
X@USER          T          *LIBL/QTXTSRC
...

```

The second screen requests Object and Document type to be entered.

```

X-Control          Update Document Defaults          Databorough Ltd.
X@DCD1            10:39:34  26/10/94
                                      WEYBRDG2

Type choices, press enter to add record.

Project . . . . . : X@CTL
X-Control file . . . . *FILE
Document type . . . . *STS
...

```

Object type

Any value may be entered to link Status records to documents.

Document Type

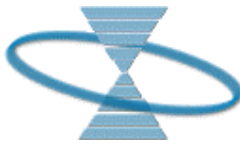
Enter *STS to link to a Status record.

Change Management Linkage

The following linkages exist for 'Document' options within Change management::

Item	Doc Type
X@ADT Audits	*N
X@LOG Request log	*N
X@RLS Releases	*N
X@USR Users	*N
X@STS Status	*FILE, *PGM etc

The third screen requests the media and source file or folder to be entered.



```
X-Control          Update Document Defaults          Databorough Ltd.
X@DCD1            10:39:34  26/10/94
                  WEYBRDG2

Type choices, press enter to add record.

Project . . . . . : X@CTL
X-Control file . . . : *FILE
Document type . . . : *STS
Media type . . . . . : T
Document extension . .
Source file . . . . . : QTXTSRC
Source library . . . . : *LIBL
Folder . . . . .

Document default . . .

F1=Help          F3=Exit          F5=Refresh          F6=Messages          Bottom
                  F24=More keys
```

Media Type

- Enter T to use a source text file and Start SEU (STRSEU) command.
- Enter E to use a source text file and Edit Source (EDTSRC) command.
- Enter D to use an Office document and Edit Document (EDTDOC) command.

Note that only source text files are currently included within Change Management reporting.

Document Extension

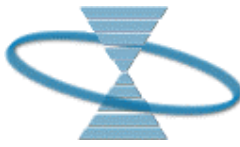
An extension may be added when using Office documents.

Source File and Library

Enter the file and library for text. *LIBL may be used for library.

Folder

Enter the folder to contain the Office documents.



Requests, Returns And Creation

Requests

Requests may be made by using the R action code, by using the X@RQS command or via options within the Change management system. When a request is made using the X-Analysis Editor action code R, all values are provided. When a request is made successfully, the following will be performed:

- A Status record will be created, see Status below. This will record the user making the request and the source and object libraries used.
- Creation default record(s) will be copied for new items and may be changed.
- Source will be copied using the Projects Environment descriptions (if not found any Related Projects Environments will be searched). The source will be copied to the environment 1 source library, unless a User Source Library has been specified, when this will be used instead.

The Request Object Retrieval (X@RQS) command may be prompted by pressing <F4>.

```

Request Object Retrieval (X@RQS)

Type choices, press Enter.

Object Name . . . . . OBJ          > *SELECT
Object Type . . . . . OBTP         > *SELECT
Object Attribute . . . . . OBAT     > *BLANK
Project . . . . . PRJ              > *SELECT
Release Number . . . . . RLS       > *DEFAULT
Audit Name . . . . . ADT           > *DEFAULT
Receiving Source File . . . . . SRCPF > *DEFAULT
  Library . . . . .                *DEFAULT
Create will use Object library  OBJLB
Request type . . . . . RQSTYP      > *NORMAL
Process related items . . . . . RELATED > *YES

...

```

Object Name

Enter the name of the object to be changed or added.

Object Type

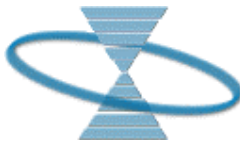
Enter the object type as *PGM, *FILE etc. or select the type from the Default descriptions by leaving as *SELECT.

Object Attribute

Enter the object attribute as RPG, PF etc. or select the attribute from the Default descriptions by leaving Object type as *SELECT.

Project

Enter the project or select from the Project descriptions by leaving as *SELECT.

**Release Number**

Enter the Release to group the changes or accept the Project or user default value.

Audit Name

Enter the Audit to group the changes or accept the Project or user default value.
The Audit entered must match the request type below.

Receiving Source File

Enter the Receiving source file qualified by library or accept the Project or user default value.

Receiving Object Library

Enter the Receiving object library or accept the Project or user default value.

Request Type

Enter *NORMAL to have the Requested item promoted from environment to environment.
Enter *EXCEPTION if the item is to be promoted direct to the Production environment.
Enter *VERSION if the item is to be promoted as normal, but is a additional version.

Ignore Related Items

Enter *YES to ignore any related items.
Enter *NO to use the X-Analysis Where-Used tool to request programs using any requested file.

Exception requests

Exception requests are designed to allow emergency changes to be made to items that are already being changed in normal development.

A normal request has the following life cycle:

- Requested into development (environment 1) to a normal Audit
- Developed, tested and flagged as Returnable
- Promoted from development to test (environment 1 to 2)
- Promoted until reaches production (maximum environment)

An exception request has the following life cycle:

- Requested into a user defined environment and exception Audit
- Developed, tested and flagged as Returnable
- Promoted from development to production (maximum environment)

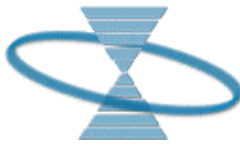
The user-defined libraries must not already contain the source or object being requested.

During promotion the exception request will be flagged as Active even though it has reached production. The normal request on reaching production will be flagged as complete.

As part of promotion, a check is made to determine if an active item exists at the production environment, if found the promotion will fail.

This check forces the user to manually set the status of exception items as complete, before another request to that item may be promoted to the production environment. (This is done on the Work with Status screen.)

This is designed to allow exception requests to be made safely, as a manual action must be made to reconcile any normal changes against exception changes.



To make an exception request, add an Audit that has to be flagged as an exception and the User must have exception request rights.

X-Analysis Interface

If the 'Stop Where-used (X@RQS)' parameter is set to 'N', (see Parameter Maintenance, below) related items that are described within X-Analysis are also requested and will be treated as belonging to the same Audit number.

Rather than accept all related items, the X-Analysis where-used feature may be used to display a review list of all related items. This list may be used to decide what additional items are needed for change. The R action code may be used with this display.

If the 'Stop Where-used Promote' parameter is set to 'N', (see Parameter Maintenance, below) related items that are not selected will be compiled at promotion. Related items that are selected will be treated as belonging to the same Audit number.

Requests may be made from the Work with Creation Descriptions screen by using option 8 against the items required. Use F4 to prompt the request. See, 'Work with Creation Descriptions'.

Requests may be made from the Work with User Status screen by using option 8 against the items required. Use <F4> to prompt the request. See, 'Work with User Status'.

Manager Request

The Project Manager may decide that requests should not be made by Programmers, but by the Project Manager or deputy.

If on the Project the 'Manager rqts. Only value is set to Y, and then this may be achieved.

The Project Manager should now use the Managers Request (X@MANRQS) command. This is available as option 11 on the Work with Creation descriptions screen.

The Managers Request (X@MANRQS) command may be prompted by pressing <F4>.

```

Manager Requests (X@MANRQS)

Type choices, press Enter.

Object Name . . . . . OBJ          > *SELECT
Object Type . . . . . OBTP         > *SELECT
Object Attribute . . . . . OBAT     > *BLANK
Project . . . . . PRJ              > *SELECT
Release Number . . . . . RLS       > *DEFAULT
Audit Name . . . . . ADT           > *DEFAULT
User profile . . . . . USER        > *SELECT
Retrieve source? . . . . . RSRG     > N
Receiving Source File . . . . . SRCPF > *DEFAULT
  Library . . . . .                *DEFAULT
Process related items . . . . . RELATED > YES

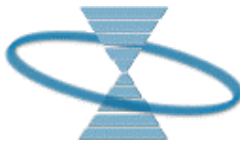
...

```

The values to entered are as for the Request (X@RQS) command above, with the two additions.

User Profile

Enter the user profile of the Programmer to make the change.

**Retrieve Source/Object**

Enter Y to copy the source and object at the time that the Manager Request is made.
Enter N to ignore this feature.

Initial Requests

When X-Control is first installed the user must chose when to start actively using the Request and Promotion features.

The user may decide to continue using the previously used change management procedures until no work remains outside of the production environments and only use X-Control after this has been achieved.

For most users this will not be a realistic option.

To aid in the process of switching to full use of X-Control the Initial Request (X@INLRQS) command may be used.

The command will determine the source members for libraries outside of the production environment. The libraries specified on the Environment records are used to find the source files. For each source member a Status record will be created describing the items found.

The command will add Creation Descriptions if they do not exist. The Initial Request (X@INLRQS) command may be prompted by pressing <F4>.

```
                Initialise Requests (X@INLRQS)

Type choices, press Enter.

Project . . . . . PRJ
Release Number . . . . . RLS          *ALL
Audit Name . . . . . ADT             *ALL
Members to request . . . . . OBJ      *ALL

...

```

Post Request for Code Generators

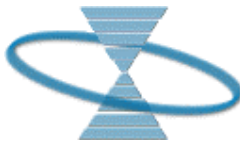
Users that develop source code using a fourth generation language or code generator may still use the X-Control system.

This is achieved by use of the Post Request (X@PSTRQS) command.

The command will determine which source and objects have changed or been created in the environment zero source and/or object library since the last time the item was requested into X-Control.

Source and object, if changed, will be requested from the environment zero into environment 1. The items may then be promoted as for a programmer requested item.

The Post Request (X@PSTRQS) command may be prompted by pressing <F4>.



```

                                Post Requests (X@PSTRQS)

Type choices, press Enter.

Project . . . . . PRJ                *SELECT
Release Number . . . . . RLS          *DEFAULT
Audit Name . . . . . ADT             *DEFAULT
Changed since Last date . . . . . LTU DT *ALL
Changed since Last time . . . . . LTUTM *ALL
Retrieve Object ? . . . . . RTVOB     *YES
Status Check . . . . . STSCHK        *YES
Print Release Report . . . . . RLSRPT  *NO

...

```

The Status Check and Release Report may be automatically run at the end of this command.

Release Report

The Release Report (X@RLSRPT) command will produce a detailed report of the items that have been requested to X-Control. The report may be sequenced by Release and Audit, User, Environment or Object. Text documentation may be included in the report. The level of detail to report may be Audit History, Status, Audit, Release or User, Environment or Object.

The Release Report (X@RLSRPT) command may be prompted by pressing <F4>.

```

                                Release report (X@RLSRPT)

Type choices, press Enter.

Project . . . . . PRJ                *ALL
Include text in report ? . . . . . TEXT *YES
Include memo in report? . . . . . MEMO  *YES
From date to report . . . . . FROM     *START
To date to report . . . . . TO         *END
Print summary or detail . . . . . LEVEL *STS
Report sequence . . . . . SEQ          *RLS

...

```

Status Check

The Status Check (X@STSCHK) command will produce a report by Release and Audit of all Status record where either source or object are missing from the library.

The Status Check (X@STSCHK) command may be prompted by pressing <F4>.

```

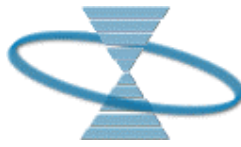
                                Status Check Report (X@STSCHK)

Type choices, press Enter.

Project . . . . . PRJ                *SELECT
Check existence type? . . . . . CHECK  *EXIST
Report sequence . . . . . SEQ          *RLS

...

```



Object Creation

Objects may be created from within the Change management system by using the Create objects (X@CRTOBJ) command. The command will combine the details from the Default and Creation Description files and the Status file, to determine object and source library, the creation command to use and the various keyword values required. If a keyword is specified on both the Default and Creation description files, the Creation value is used.

Option 10 on the Work with Default descriptions, Work with Creation Descriptions and Work with User Status screens, allow the creation command to be prompted. Un-used keywords are dropped and the resulting details will be compressed into the database.

For more details for these files see below.

Option 3 on the Work with User Status screen will create an individual object. Option 3 on the Work with Audit descriptions screen will create all objects within the Audit. Objects are created in their Creation sequence using the Source library and into the Object library specified on each Status record.

The Create object (X@CRTOBJ) command may be prompted by pressing <F4>.

```
                Create Objects (X@CRTOBJ)

Type choices, press Enter.

Project . . . . . PRJ
Release . . . . . RLS                *ALL
Audit Name . . . . . ADT            *ALL
Environment . . . . . ENV            1
Object Name . . . . . OBJ            *ALL
Object Type . . . . . OBTP           *ALL
Object Attribute . . . . . OBAT       *ALL

...

```

Returns

When a return is made the Status record is flagged as complete. No source or object promotion takes place. Returns may be made from the editor by using action code U, by using the X@RTN command or by using option 7 on the Work with Status screen.

Returns may be made for an Audit number by using option 17, on the Work with Audit screen.

The Return (X@RTN) command may be prompted by pressing <F4>.

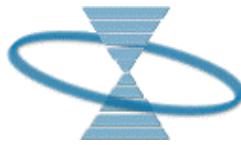
```
                Return change as completed (X@RTN)

Type choices, press Enter.

Object Name . . . . . OBJ                *ALL
Object Type . . . . . OBTP               *ALL
Object Attribute . . . . . OBAT           *ALL
Project . . . . . PRJ                    *SELECT
Release Number . . . . . RLS              *ALL
Audit Name . . . . . ADT                  *ALL
Flag setting type . . . . . FLAG           *YES

...

```



Re-Request

Items that have been promoted may be Re-requested. This allows items that have failed System test, to be replaced into the development environment. The item keeps the same Audit id and is removed from the second environment. The Status record is changed to keep track of the new environment.

Database files (physical and logical files) may not be re-requested.

Re-request is available with option 14 from the Work with Status screen.

The Re-request item (X@RERQS) command may be prompted by pressing <F4>.

```
Re-request item (X@RERQS)

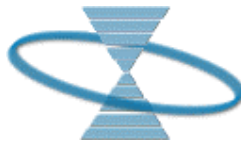
Type choices, press Enter.

Object Name . . . . . OBJ          *ALL
Object Type . . . . . OBTP         *ALL
Project . . . . . PRJ             *SELECT
Release Number . . . . . RLS       *SELECT
Audit Name . . . . . ADT          *ALL

...

```

To make a separate change to the same item, use a different Audit and the Request (X@RQS) command.



Promotion

Promotion is usually performed by an Operator.

Promotion may be performed, using option 12, for an item on the Work with Control Status, from the Work with Audit descriptions or from the Work with Release screen. This allows all of an Audit or Release to be promoted together. During promotion (which takes place in batch) objects are created, duplicated or moved in the order of their creation sequence.

If objects exist at the target environment, they are moved to X@MANT (or the archive library if this has been specified) and created at the target environment. This allows data to be retained, related items (logical files) to be re-created, journaling to be maintained and authority to be copied.

The Promote Objects (X@PRMOBJ) command may be prompted by pressing <F4>.

```
Promote Objects (X@PRMOBJ)

Type choices, press Enter.

Project . . . . . PRJ
Release . . . . . RLS          *ALL
Audit Name . . . . . ADT      *ALL
From Environment . . . . . ENV 1
Object Name . . . . . OBJ     *ALL
Object Type . . . . . OBTP    *ALL
Object Attribute . . . . . OBAT *ALL

...

```

Promotion Details

When Promotion is requested various checks are performed, i) at the time the request is made and ii) when the Promotion is performed.

Pre-Checks.

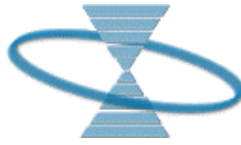
The types of checks performed depend on the action Move or Create/Duplicate. Moves are always pre-checked to ensure that the object exists in the from Environment.

Items that have not been flagged, as Returned may not be promoted.

Run-Time Checks.

The Move action will only replace existing objects at the Production environment; this is the maximum environment (not counting archive 9).

Promotion will fail if a Status record is found for an object at the destination environment, unless this is the maximum environment. For create/duplicate the promotion will fail if the object could not be created/duplicated. As a rule source will not be promoted until the object has been promoted successfully.



Destination Libraries

The Work with Environment display will list the environments and the source libraries and object owners to be used.

Option 7 from the Work with Environments display will present the Work with Object Library Lists display. This display will usually have defaults set-up by the Generate Project function, which is run whenever a Project is added.

Any object type/attribute combination may have its own record, on this display. Object type/attribute combinations that do not appear will use the blank Type/attribute record, which appears, at the top of the list.

The libraries listed are those to be used when promoting into the environment. The action codes allowed are C (create), D (create duplicate object) and M (move).

The Split id is used to allow different objects of the same type to be promoted to different libraries. The Split id is matched to the same field on the Creation description. This would allow End-of-day and End-of-week data libraries to be automatically maintained.

Batch Compilation History

When a promotion is run the necessary commands are placed on the Batch Compilation file. This file may be displayed with option 25 from the Work with Projects display and from the Work with Status and Audit displays (for the last Batch for the item).

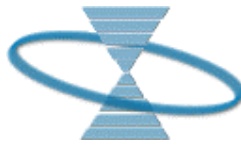
(In previous releases the Work with Batches (X@BCN) command displayed this data.)

The status for a Batch may be one of the following:

- A - active (has not been run).
- C - completed normally.
- F - failed, but may be re-promoted.
- I - in-progress.

This information combined with a job log should allow any problems to be resolved.

As an aid to Promotion and Audit two reports exist, the Release Report and the Status Check report. Both the reports use the Control Status file.



Release Management

The system may also be used where a site acts as a supplier of software either to another company branch or to clients. Releases may be sent by Tape or by using SNADS. If a release library has been specified on the Project, the Promotion processing will be adding source and/or objects to this library. When the release is required, the Send Release (X@SNDRLS) or Save Release (X@SAVRLS) command may be used.

When the release arrives at the destination machine, the Receive Release (X@RCVRLS) or Restore Release (X@RSTRLS) command may be used to place the release library on the machine and the Install Release (X@INLRLS), Load Release (X@LDRLS) or Post Request (X@PSTRQS) command to place the items into Production.

Release Management of Logical Files

OS/400 has some restrictions when processing Logical files. These impact X-Control in two ways:-

- During promotion when the Create duplicate object (CRTDUPOBJ) command is used.
- When receiving releases on a remote system when the Restore library (RSTLIB) command is used.

Create Duplicate Object Restrictions

When duplicating logical files into the release library or into a duplicate database there are two cases:

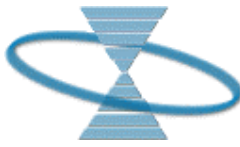
- If both the logical file and based-on physical file are originally in the same library, a duplicate of the physical file must be created in the new library before a duplicate of the logical file can be created. This is normally not a problem with duplicate database libraries, but implies that physical and logical files must be promoted together if a release library is being generated.
- If the logical and physical files are originally in different libraries, the physical file need not be duplicated. This implies that the duplicated physical and logical files should be in different libraries, but this will cause the duplicated libraries logical files to point to the original physical file not the duplicate database physical file.

Users must chose between the two cases above or send source to the release library and re-create logical files after the Install or Load Release commands have been used.

Using environment 2 with physical and logical files split into different libraries can be used, environment 3 and beyond can then have physical and logical files in the same library. Environment 2 then becomes the release environment, but should not have any duplicate database libraries.

Restore Library Restrictions

The Restore library (RSTLIB) command is used in the Receive Release (X@RCVRLS) command. When restoring a release library there are two restrictions. These are similar to those for creating duplicates:



- If the logical file and the based-on physical file are saved together from the same library, then they must be restored together. The Receive Release (X@RCVRLS) command does this when logical and based-on physical files are promoted together.
- If the logical file is in a different library to the based-on physical file, the physical file must be in the same library on the target system. This implies that the library names must be identical on the target and source systems.

Again users must chose between the two cases above or send source to the release library and re-create logical files.

Send Release

The Send Release (X@SNDRLS) command saves the Release library to a save file and then sends that save file via SNADS to the destination User Id and Address.

Optionally, a Receive Release command may be automatically sent to the destination.

The Send Release (X@SNDRLS) command may be prompted by pressing <F4>.

```
Send Release via SNADS (X@SNDRLS)

Type choices, press Enter.

Project . . . . . PRJ
Release library . . . . . RLSLIB
User id . . . . . USRID          *SELECT
  Address . . . . .
Save file library . . . . . MAND          X@MAND
Automatic remote receive . . . . . RMTRCV          *NO

...

```

Save Release

The Save Release (X@SAVRLS) command will initialize a tape and perform a save library command for the release library.

The Save Release (X@SAVRLS) command may be prompted by pressing <F4>.

```
Save release (X@SAVRLS)

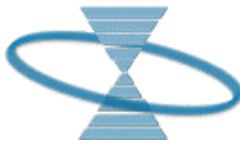
Type choices, press Enter.

Current release library . . . . . LIB
Tape device name . . . . . DEV          TAP01
Tape volume . . . . . VOL          SAVE
Check for active files . . . . . CHECK          *NO
Tape density . . . . . DEN          10000
Target release . . . . . TGTRLS          *PRV

...

```

If the Save Release command does not contain the required keywords, the user should either use the IBM Save Library (SAVLIB) command or contact Databorough for details of how to customize this feature.



Receive Release

The Receive Release (X@RCVRLS) command will receive the SNADS file sent by the Send Release command and restore the library from that save file to a specified library.

The Receive Release (X@RCVRLS) command may be prompted by pressing <F4>.

```
Receive Release from SNADS (X@RCVRLS)

Type choices, press Enter.

Project . . . . . PRJ
Saved Library . . . . . SAVLIB
From file . . . . . FROMFILE      *SAVLIB
Restore to library . . . . . RSTLIB  *SAVLIB
Allow object differences . . . . . ALWOBJDIF *NONE
Return User id . . . . . RTNUSRID  *NONE
  Return Address . . . . .
Load/Install Release type? . . . . . TYPE      *NONE
User . . . . . USER      *CURRENT
Save file . . . . . SAVF      *SAVLIB
Save file library . . . . . SAVFLIB  X@MAND
X-Control data library . . . . . DATALIB  *LIBL
...

```

Restore Release

The Restore Release (X@RSTRLS) command currently uses the Restore Library (RSTLIB) command.

Install Release

The Install Release (X@INSRSL) command moves source and objects from one library to another. Data, logical files, journaling, ownership and authority are maintained for existing objects.

The Install Release (X@INSRSL) command may be prompted by pressing <F4>.

```
Install a Software Release (X@INSRSL)

Type choices, press Enter.

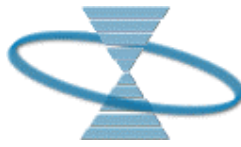
From Library . . . . . Name
To Library . . . . . Name
X-Control Object Library . . . . . X@MAN Name
Create Duplicates by Library? . . . . . *YES Logical value, *YES, Y...
...

```

Post Request With a Received Release Library

The Post Request (X@PSTRQS) command may be used to describe the incoming source and objects to another X-Control database.

The release library should be restored as the environment zero source/object library. See Post Request for Code Generators, above.



X-Analysis Interface

X-Analysis Module 1 Interface

Action codes

The X-Analysis editor supports action codes to allow requests and returns to be made from program and file lists. These are:

- O - Enter object management via X-Analysis/X-Control Interface menu
- R - Request/lock item
- U - Unlock/return flag as completed item

These action codes may be used if the 'Stop X-Control' parameter is set to 'N', the X-Control libraries are in the library list and an Application/Project record has been entered. Function key F6 will display the Work with User Status screen for programmers.

Automatically Maintaining X-Analysis

Both Import and Delete may be automatically performed for a Project that is linked to X-Analysis. Add an Application/Project linkage record to describe the X-Analysis data library and Application to be used.

- Enter 'Y' in the Import field to perform Imports during promotion.
- Enter 'Y' in the Delete field to reclaim X-Analysis memory after an item has been promoted.
-

Programs, commands and physical, logical, display and printer files may be imported into X-Analysis.

Please note that if a display file is imported but the program to which it is linked has not been imported the display file name will be added to the list of programs. To rectify this delete the display file name from the list of programs and import the program with the Outline and Screen/Report parameter set to *YES.

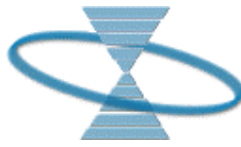
X-Analysis Module 2 Interface

The Import Program (X@IPGM) command may have the APYSEU keyword default changed to use the X-Analysis Module 2 source comparison.

SYSTEM/PROJECT PRO-FORMA

Each Change Management database generated using the CRTX@MAN command will need a Library Name, Text, Owner and Authority List (defaults to Library Name).

Each Project will need a Project Name, Project Manager, Maximum number of environments and the Libraries used by each Environment. The Users of each Project and User Type will also be needed.



To aid in planning for the installation please use as many copies of the pro-forma below as you require.

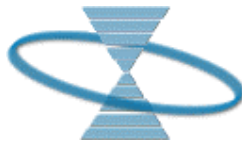
Change management database library:				
System owner:				
Project:				
Description:				
Copy Users from project:				
Copy Doc Dfts from project:				
Env	Source lib.	Object lib.	Data lib.	Owner
1				
2				
3				
4				
5				
6				
7				
8				
9				

Generate Project Data

A source, object and data library and an owner may be entered for each Environment up to the maximum for the Project. These details will be used to generate Environment, Object Library, Default creation strings, User and Authority records.

After all Projects required have been entered, the generated details may be reviewed and changed.

1. Select the option to review the Environments generated, see Environments, below.
2. Select the option to review the Object Library Lists generated, see Object Library Lists, below.
3. Select the option to add any Object Read Only Libraries. See Object Read Only Libraries, below.
4. Select the option to review the User Descriptions generated. See User Descriptions, below.
5. Select the option to review the Authority generated. See Authority, below.
6. Select the option to add Application/Project details for the interface to X-Analysis. See Application/Projects Linkage, below.

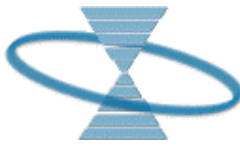


Security

The Security Officer user profile is used, via adopted authority to create, move and duplicate objects and to copy and remove source.

To secure the database from unauthorized update, IBM security should be used to restrict Programmer and Operator access to the Change management database. The CRTX@MAN command (see above) will create the database in a restricted state.

The User and Authority files, see below, may be used to secure users from each Project.



The Maintenance Programs

The X-Control database is largely maintained by programs generated from X-Analysis module 6 templates. The basic features of the templates used are described in the Module 6 documentation. Within Change Management additional options and function keys have been added when required.

Standard Options

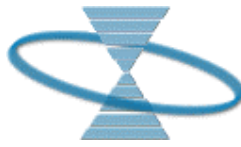
Option	Description
1	Add another record to file
2	Change an existing record
4	Delete an existing record (confirmation requested)
5	Display a record
6	Print a record

Standard Functions Keys

Each display supports a set of function keys that allow you to perform specific tasks. Usually, the keys are listed at the bottom of the display.

The function keys may always be used, even if they are not displayed.

F1=Help	Press F1 to see information about this display.
F3=Exit	Press F3 to leave this display.
F5=Refresh	Press F5 to re-display the current display.
F6=Messages	Press F6 to display any messages.
F7=Next master	Press F7 to display details for the next master, if a master is shown.
F8=Prev master	Press F8 to display details for the previous master, if a master is shown.
F9=System cmd	Press F9 to use the System command entry display.
F12=Cancel	Press F12 to cancel the current display.
F13=Fast exit	Press F13 to leave the current display and a number of previous levels.
F14=Wkrsbmjob	Press F14 to work with submitted jobs.
F21=Dspoutq	Press F21 to work with X-analysis output reports.
F22=Utilities	Press F22 to display the X-analysis utilities.
F24=More keys	Press F24 to display any more functions keys that are available for this display.



Standard Messages

Could not locate item requested.

The item you requested was not found. The display will be re-positioned to the nearest item.

Already at top of file.

You requested roll-down, but no more records exist above this position.

Specified option not allowed.

The option you entered against an item is not valid for this display. Please use F1 or HELP to display the valid options.

No data found.

There is currently no data for the item you have requested. Data may be entered using option 1.

First option displayed.

You have pressed F23 and the options are now re-displayed from the first option.

First function key displayed.

You have pressed F24 and the function keys now displayed start from the first function key.

Record not found

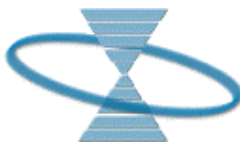
The record you requested does not exist in this file.

Entering X-Control

Programmers should use the Work with User Status (X@WRKSTS) command or the X-Analysis editor to see their own outstanding items. Function F6 from the X-Analysis editor will display the Work with User Status screen.

To view or change Status items for all users, the Work with Projects (X@PRJ) command should be used. The O action code from a Application list in the X-Analysis editor will display this screen. All files in the database (except System descriptions and Create sequences) may be viewed from the Work with Projects screen.

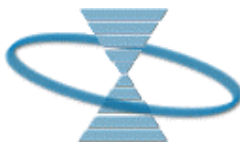
Starting at the Work with Projects display, the following additional options are available:

**Work with Projects (X@PRJ)**

Option	Program	Description
7	X@ADT	Work with Audit file
8	X@ENV	Work with Environments
9	X@SNDRLS	Send release
10	X@PSTRQS	Post request
11	X@RCVRLS	Receive release
12	X@LOG	Work with Request log
13	X@USR	Work with User descriptions
14	X@CRT	Work with Creation descriptions
15	X@OVR	Work with Overrides
16	X@MSG	Work with Messages
17	X@DFT	Work with Defaults
18	X@SRP	Work with Read-Only projects
19	@APP	Work with App/Project linkage
20	X@DCD	Work with Document defaults
21	X@WRKSTS	Work with Control status
22	X@SJS	Work with Submit Job Strings
23	X@UST	Work with User types
24	X@RLS	Work with Releases
25	X@BCN	Work with Batches
26	X@NPM	Work with Narratives (only with module 8)
27	X@DPP	Work with Default Processing
30	X@SAVRLS	Save Release Library to tape
31	RSTLIB	Restore Release Library from tape
32	X@INSRLS	Install Release
39	X@CPT	Work with Command Prompts

Work with Audit File (X@ADT)

Option	Program	Description
7	X@STS	Work with Status
8	X@ADP	Work with Audit pre-requisites
9	X@LOG	Work with Request Log
10	X@ADTRLS	Change Audit Release
11	X@QSDOC	Edit Documentation
12	X@PRMOBJ	Promotions
13	X@RLSRPT	Release report
14	X@BCKOUT	Back-out
15	X@STSCHK	Status check report
17	X@RTN	Return
18	X@RQS	Request Object Retrieval
19	X@LOGRPT	Request Log Report
25	X@BCN	Work with Batches
28	X@SNDRLS	Send Library
29	X@RCVRLS	Receive Library
30	X@SAVRLS	Save Release Library to tape
31	RSTLIB	Restore Release Library from tape
33	X@APYADT	Apply Release
34	X@SRH	Work with Send/Receive History

**Work with Status (X@STS)**

Option	Program	Description
7	X@ADH	Work with Audit history
8	X@STSADT	Change Status Audit
10		Prompt Creation Parameters
11	X@QSDOC	Edit Documentation
12	X@PRMOBJ	Promotions
14	X@RERQS	Re-Request
15	X@OVR	Work with Overrides
16	EDTOBJAUT	Edit object authority
17	WRKOBJPDM	Work with Objects using PDM
18	WRKMBRPDM	Work with Members using PDM
25	X@BCN	Work with Batches

Work with Environments (X@ENV)

Option	Program	Description
7	X@OLB	Work with Object Library List
8	X@ORL	Work with Object Read-only Libraries
12	X@STS	Work with Status
13	X@RLSRPT	Release report
16	EDTOBJAUT	Edit object authority
17	WRKLBPDM	Work with Libraries using PDM
18	WRKMBRPDM	Work with Members using PDM

Work with Object Libraries (X@OLB)

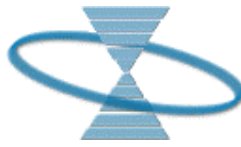
Option	Program	Description
7	X@ODP	Work with Object Library Duplicates
16	EDTOBJAUT	Edit object authority
17	WRKOBJPDM	Work with Object using PDM

Work with Object Read-Only Libraries (X@ORL)

Option	Program	Description
16	EDTOBJAUT	Edit object authority
17	WRKOBJPDM	Work with Object using PDM

Work with Request Log (X@LOG)

Option	Program	Description
7	X@STS	Work with Status
8	X@ADT	Work Audit descriptions
9	X@QSDOC	Edit Documentation

**Work with User Descriptions (X@USR)**

Option	Program	Description
7	X@UDF	Work with User Object Defaults
8	X@UDS	Work with User Source Default
9	X@ATH	Work with Authority
10	X@PTU	Work with User Program Defaults
11	X@QSDOC	Edit Documentation
12	X@STS	Work with Status
13	X@RLSRPT	Release report
14	X@URC	Work with User Restrictions
15	X@STSCHK	Work with Status Check
19	X@LOGRPT	Request Log Report

Work with User Object Defaults (X@UDF)

Option	Program	Description
16	EDTOBJAUT	Edit object authority
17	WRKOBJPDM	Work with Object using PDM

Work with User Source Default (X@UDS)

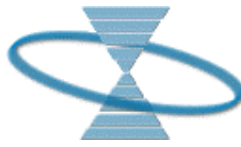
Option	Program	Description
16	EDTOBJAUT	Edit object authority
17	WRKOBJPDM	Work with Object using PDM

Work with Creation Descriptions (X@CRT)

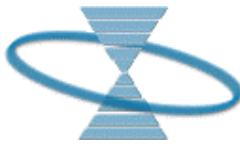
Option	Program	Description
7	X@CRT2	Add entries
8	X@RQS	Request
10		Prompt Creation Parameters
11	X@MANRQS	Manager Request
12	X@STS	Work with Status
13	X@RLSRPT	Release report
14	X@OPP	Work with Pre- and Post-Processing
15	X@PRJCRT	Change Creation Project
16	EDTOBJAUT	Edit object authority
17	WRKOBJPDM	Work with Objects using PDM
18	WRKMBRPDM	Work with Members using PDM
19	X@LOGRPT	Request Log Report

Work with Default description (X@DFT)

Option	Program	Description
7	X@DFV	Work with Default keywords
10		Prompt Creation Parameters

**Work with User Status (X@WRKSTS)**

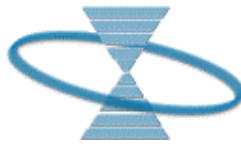
Option	Program	Description
2	STRSEU	Start Source Entry Utility
3	X@CRTOBJ	Create object
4	RMVM /X@DLTOBJ	Delete record, member and object
7	X@RTN	Return
8	X@RQS	Request
9	STRSDA	Start SDA
10		Prompt Creation Parameters
11	X@QSDOC	Edit Documentation
12	X@PRMOBJ	Promotions
13		Flag as tested
14	X@RERQS	Re-Request
15	X@OVR	Work with Overrides
16	EDTOBJAUT	Edit object authority
17	WRKOBJPDM	Work with Objects using PDM
18	WRKMBRPDM	Work with Members using PDM
19	STRRLU	Start report layout utility
20	X@GMSGID	Generate Message id (module 8 only)
21	X@NPM	Work with Narratives (module 8 only)
22	X@STS1	Update Control Status
23	X@CRT1	Update Creation Descriptions
24	X@OPP	Work With Object Processing
25	X@BCN	Work with Batches
26	X@EHLP	Export Help
27	X@DSPHLP	Display Help
28	X@DDSHLP	Apply DDS Help
29	X@CHKOBJ	Check Object Exists
30	X@	Enter X-Analysis
31		X-Analysis Import for Object Type
32		X-Analysis Export for Object Type
33	X@WU	Where-Used
34	X@IPGMD	Import Program Devices
35	X@EPGMD	Export Program Devices
36	X@ALCOBJ	X-Analysis Allocate Object
37	X@DLCOBJ	X-Analysis De-Allocate Object

**Work with Releases (X@RLS)**

Option	Program	Description
7	X@ADT	Work with Audit descriptions
8	X@SRLS	Set Release/Audit Environments
11	X@QSDOC	Edit Documentation
12	X@PRMOBJ	Promotions
13	X@RLSRPT	Release report
14	X@BCKOUT	Back-out
15	X@STSCHK	Status check report
16	X@RECRTOBJ	Re-create Dependent Objects
17	X@RTN	Return
25	X@BCN	Work with Batches
28	X@SNDRLS	Send Library
29	X@RCVRLS	Receive Library
30	X@SAVRLS	Save Release Library to tape
31	RSTLIB	Restore Release Library from tape
33	X@APYADT	Apply Release
34	X@SRH	Work with Send/Receive History

Work with Batches (X@BCN)

Option	Program	Description
7	X@BCM	Work Batch Compilation history
8	X@BCMRPT	Batch report



The Database

Audit History (X@ADH)

Contains a history of actions performed on an object. Audit History is optional and is only maintained if the 'Audit History' flag on the project record is set to 'Y'. Actions (and the associated record types) which are logged on the Audit History file include:

- Initial Load I
- Requests R
- Returns T
- Promotions P

Audit Pre-Requisites (X@ADP)

Holds a list of Pre-Requisite Audit numbers, which must be promoted before this Audit number. If used, this feature ensures that Audits are promoted in the correct sequence.

Audit Descriptions (X@ADT)

Describes an Audit (Change Control) number. The Audit number will be used throughout the development cycle of an object. When a request is made, the audit number will be placed into the Control Status record, which is generated by the system.

If source changes are applied within X-Analysis, the Audit number is logged on the modified lines of code.

Application/Project Linkage (X@APP)

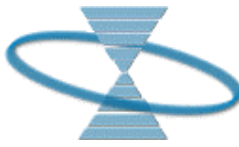
Defines the link between an Application (X-Analysis) and a Project (Change Management). Option 19 from Work with Projects. Enter the Environment (1 for interactive) where the link occurs and the X-Analysis Application to be maintained.

Enter X-Analysis data library, and flag the automatic import and delete as required. The status should be A.

Authority (X@ATH)

Controls authority to the Change Management database by Project/User Type and User. The following special values may be used:

- *SYSOWN - System Owner.
- *PRJMAN - Project Manager.
- *PGMR - Programmer.
- *OPER - Operator.
- *PUBLIC - Public authority.



Authority will be checked in the following order:

1. User
2. User Type
3. *PUBLIC.

The first record found will determine the authority granted.

Batch History (X@BCN)

Contains a record for each promotion. Promotions may be re-started from here. The date, time and requester are also held on this file.

Batch History details (X@BCM)

Contains a record for each CL command that was performed to action a creation or promotion. (Note creations do not appear on the Batch History file above, but are still recorded.)

Creation Descriptions (X@CRT)

Contains one record for each item within the Project. The file may be loaded automatically when the project is defined, using the Retrieve Object Description (X@ROBJD) command. Records are added automatically if a request is made for a new item.

Creation Sequences (X@CTS)

Describes the sequence in which objects are to be compiled or promoted. When requests are made, the creation sequence is written to the Control Status file. The Creation Sequence ensures that objects are compiled or promoted in the correct order, typically:

- 1 Field Reference Files
- 2 Physical Files
- 3 Logical Files
- .
- .
- 9 Programs

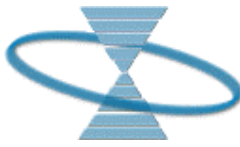
Only the System Owner should have change rights to this file.

Documentation Defaults (X@DCD)

Describes defaults for how items are linked to documentation. Entries may be added to link documentation to Audits, Status records, Request log, Release and User details.

Default descriptions (X@DFT)

Contains a description of each object type that may be requested within the Project. The normal IBM object types are supported. User object types may also be added. New IBM object types may be added by the user as required. Object types not required, for example RPG38 may be deleted. These object types may not be requested for that Project.



Default keywords (X@DFV)

Contains the linkage between X-Control data fields from the Status and Creation files to the command keywords. For example, *OBJ and PGM, on the CRTRPGPGM command links the X-Control Object name to the program keyword.

Default Pre- and Post-Processing (X@DPP)

Contains user described processing that should be performed before and/or after creation and promotion, by release/audit/environment.

Environments (X@ENV)

The system provides up to 8 working environments for each project. An environment definition consists of a source library and any number of object libraries for an object type/attribute combination.

Environment 9 is reserved by Change Management to enable an Archive library to be defined. Before promoting source and object to the production level, the current production source and object are placed in the archive library. This allows removal of changes in the event of a serious error in a new object.

Environment 0 is reserved by Change Management for the Post Request (X@PSTRQS) command. This enables software produced by third party software or on another machine to be promoted via the Change Management system.

Request log (X@LOG)

Describes errors and enhancements to the system. Priorities and assignments may be entered.

Messages (X@MSG)

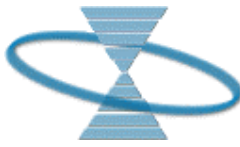
Contains a list of messages in a message file. The message id and message are held in file X@MSG, while second level text and severity etc. are placed in the Creation string file. This file is also used by module 8, X-Translate, to store messages used as text.

Object Library Duplicates (X@ODP)

Contains entries that describe which objects should be duplicated into what libraries. Allows duplicate test databases to be automatically maintained.

Object Libraries (X@OLB)

Identifies the names of the libraries at each environment level, which will contain objects of an object type/attribute combination. This allows database files to be placed into separate libraries from programs, displays, and printer files etc.



Object Pre- and Post-Processing (X@OPP)

Contains user described processing that should be performed before and/or after creation and promotion, by object. For file over-rides, see the X@OVR file below.

Read Only Libraries (X@ORL)

Defines additional libraries, which are needed in the batch library list when an object is compiled or promoted. e.g. QTEMP and QGPL.

Over-rides (X@OVR)

Describes any overrides that are needed to compile a program. The overrides are automatically applied by Change Management before compiling the program.

Project Descriptions (X@PRJ)

Describes each Project as defined by the System Owner. Various validation rules are held in the project file. Only the System Owner may add and delete Projects. Only the System Owner and Project Managers may change Project details.

Release Descriptions (X@RLS)

Describes a software Release number. The Release number groups sets of Audit numbers. When a Project is added to the system a *NONE release is generated. Users may wish to delete these releases.

Submit Job Strings (X@SJS)

For a given project/command combination, and optionally for an user and environment allows submit job parameters to be specified, e.g. JOBQ.

Read Only Projects (X@SRP)

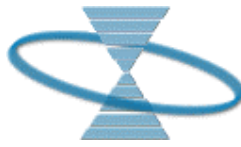
Describe additional Projects where source may be found a request. These lists are only used if the source is not found within the requesting project. Typically Third Party software.

Status codes (X@STC)

Contains user defined Status codes. These may be used on the Control Status file.

Control Status (X@STS)

The Control Status file contains 1 record for each object, which is currently under development. A record is automatically added to the file when a request is made. When an object is promoted, the current source library, object library, environment and status are updated by the system.



System descriptions (X@SYS)

Contains a list of all System libraries, which have been created by the CRTX@MAN command. Only the System Owner should have change rights to this file.

User Default Object Libraries (X@UDF)

Defines user default object libraries. When a request is made, the object library in the Control Status record will be updated with the value from the X@UDF file. Object libraries may be defined for each object type/attribute combination.

User Default Source Library (X@UDS)

Describes a user default source library. When a request is made, the source will be placed in the library specified in the X@UDS file.

Default release and audit details may also be added.

Press <F15> on the Work with User Status to access your own default record.

User Restrictions (X@URC)

File X@URC contains a record for each User/Project combination. A 'To' environment must be entered to restrict promotion from the previous environment to that environment only. Object type and attribute may also be entered to provide further restriction.

User Descriptions (X@USR)

File X@USR contains a record for each User/Project combination. The User Type field must be entered to identify the type of user:

- S - System Owner.
- M - Project Manager.
- O - Operator.
- P - Programmer.

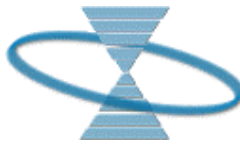
Programmers do not normally have any promotion rights and should have their Maximum promotion level set to zero.

The System Owner and Project Manager do not need to be described on this file, unless restricted authority is required.

User types (X@UST)

Contains user defined User Types.

The user may decide to add additional user types to a project. These user types may then be used when enrolling Users to a project.



Parameter Maintenance

X-Control	Parameter Maintenance	Databorough Ltd.
Type choices, press enter.		
Create Environment 2 . . .	Y	(Y or N)
Promote all Return . . .	N	(Y or N)
Add FRF on Projects . . .	Y	(Y or N)
X@ROBJD on Projects . . .	Y	(Y or N)
Stop submit error	Y	(Y or N)
Stop Where-used (X@RQS)	N	(Y or N)
Stop Where-used Promote	Y	(Y or N)
Stop Where-used Create	Y	(Y or N)
Submit Job	N	(Y or N)
Promotion priority . . .	5	(5 to 9)
Promotion hold job . . .	N	(Y or N)
Creation priority . . .	5	(5 to 9)
Creation hold job . . .	N	(Y or N)
X@MDEV field prefix . .	#	
Audit stamp mbr text . .	N	(Y or N)
Audit stamp source . . .	Y	(Y or N)
More...		
F1=Help	F3=Exit	F5=Refresh
F6=Messages	F24=More keys	

Parameter maintenance allows the way the Change Management system works to be adjusted to suit each customer. Each parameter should be examined to determine which setting is best for individual customers.

Defaults are available for each parameter.

Create Environment 2

- Enter Y to default all environment 2 actions to be Create, when a Project is added.
- Enter N to default to Move when adding a Project.

Promote All Return

- Enter Y to default all returns as yes when adding a Project.
- Enter N to default to No.

Add Frf on Projects

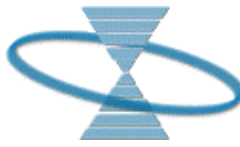
- Enter Y to be presented with the Work with Creation Descriptions when adding a Project. This allows Field reference files to be added before the Retrieve object description command is performed.
- Enter N to ignore this option.

X@robjd on Projects

- Enter Y to be presented with the Retrieve Object Descriptions command when adding a Project.
- Enter N to ignore this option.

Stop Submit Error

- Enter Y so that submitted jobs, which fail, will return an abnormal termination message.



- Enter N so that submitted jobs will terminate normally. This allows systems where client described routing entries to be used that do not run under QCMD (or QCL for System/38).

Stop Where-used X@RQS

- Enter Y to stop the X-analysis Where-used feature being used during Requests.
- Enter N to use the Where-used. Please note that an X-analysis Application record must be entered to describe X-analysis to X-control.

If required, the X-Analysis action code W may be used to display related items. The R action code may be used to Request related items from this display.

Stop Where-used Create

- Enter Y to stop the X-analysis Where-used feature being used during Creation.
- Enter N to use the Where-used. Please note that an X-analysis Application record must be entered to describe X-analysis to X-control.

Stop Where-used Promote

- Enter Y to stop the X-analysis Where-used feature being used during Promotion
- Enter N to use the Where-used. Please note that an X-analysis Application record must be entered to describe X-analysis to X-control.

Submit Job

- Enter Y to default Submit requests to batch.
- Enter N to perform requests interactively.

Promotion Priority

Enter the Job priority to be used for submitted Promotions.
The value must be in the range 5 to 9, with 5 as the highest priority.

Promotion Hold Job

- Enter Y to hold submitted Promotions on the job queue until manually released.
- Enter N to process submitted Promotions when the job queue will allow.

Creation Priority

Enter the Job priority to be used for submitted Creations.
The value must be in the range 5 to 9, with 5 as the highest priority.

Creation Hold Job

- Enter Y to hold submitted Creations on the job queue until manually released.
- Enter N to process submitted Creations when the job queue will allow.

X@mdev Field Prefix

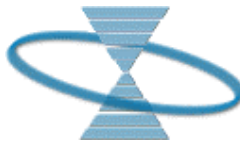
Enter the character to be used to prefix generated field names when using the X@MDEV1 command.

Audit Stamp Mbr Text

On request it is possible to place the Audit id in the last 10 characters of a source member text.

- Enter Y to Audit stamp the member text.
- Enter N to maintain member text as manually entered.

Audit Stamp Source



On request it is possible to add the Audit id, User making the request, date and Audit description in the first line of a source member.

- Enter Y to Audit stamp the source member.
- Enter N to maintain source members manually.

X-Control	Parameter Maintenance	Databorough Ltd.
Type choices, press enter.		
Add/chg message files.	Y	(Y or N)
Project/Object unique.	N	(Y, N or M)
X-A use Object History	N	(Y or N)
Allocate libraries . .	Y	(Y or N)
Audit stamp comments .	N	(Y or N)
Audit pre-req all Prjs	N	(Y or N)
Translate messages	Y	(Y or N)
Request program devices	Y	(Y or N)
Stop use of CRTLIB	N	(Y or N)
Stop use of CRTUSRPRF	N	(Y or N)
Allow Re-request at Max	Y	(Y or N)
Secure X@MANP to Sysown	N	(Y or N)
Auto-create Projects .	N	(Y or N)
Only promote objects .	N	(Y or N)
Request ignores source	N	(Y or N)
Allow Re-request PF/LF?	Y	(Y or N)
More...		
F1=Help	F3=Exit	F5=Refresh
F6=Messages	F24=More keys	

Add/Chg Message Files

The Change Management system allows message identifiers to be changes and generated within the database. The database is then used to create a message file. However, the system may also create and change message identifiers at the same time as the database is changed.

- Enter Y to make changes to message files when the database is changed.
- Enter N to ignore this feature.

Project/Object Unique

- Enter Y to force Creation records to be unique between projects.
- Enter N to allow items to be in more than one project.

X-A Uses Object History

- Enter Y to display the Object History screen when using action code O, from X-Analysis.
- Enter N to display the Work with User Status screen.

Allocate Libraries

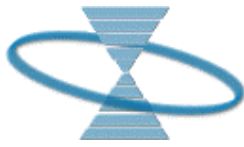
- Enter Y to allocate all libraries during a multiple item promotion.
- Enter N to ignore this feature.

Audit Stamp Comment

On request it is possible to add the Audit comment into any source that is retrieved.

- Enter Y to copy Audit comments to source members.
- Enter N to maintain source members manually.

Audit Pre-Req All Prjs



- Enter Y to check that Audit pre-requisites are not active across all Projects. If using this feature, only attach Audit Pre-requisites to one Project.
 - Enter N to check pre-requisites in the promoting project only.
- For more details see Work with Audit pre-requisites X@ADP.

Translate Messages

The Update Messages program is able to present the user with additional translations of messages.

For example if Project is changed to Project, all messages beginning with Project.... are presented to the user as Project... This allows improved translation of messages.

Enter Y to use this feature.

Enter N to ignore this feature.

Request Program Devices

- Enter Y to have requests for programs also request any display or printer file used in the program.
- Enter N to ignore this feature.

Stop Use of Crtlib

- Enter Y to prevent use of the CRTLIB command.
- Enter N to ignore this feature.

Stop use of CRTUSRPRF

- Enter Y to stop the automatic prompt of the Create User Profile (CRTUSRPRF) command that X-Control performs when a User is entered into the database, but does not exist on the iSeries.
- Enter N to continue using the command.

Allow Re-request at Max

- Enter Y to allow Re-requests to be made for items at the Environment limit.
This is usually the Production environment. If an Archive is found then source and object will replace the Production source and object, which will be moved to Development, (Environment 1).
- Enter N to stop these types of Re-request.

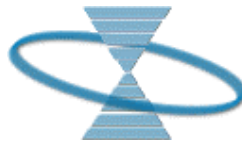
Secure X@MANP to Sysown**Auto-create Projects**

- Enter Y to enable the Automatic creation of Projects.
If the O action code is entered against an Application in X-Analysis and a Project of the same name is not found in X-Control, the Project will be automatically created.
- Enter N to disable this automatic creation.

Only promote objects

- Enter Y to only promote objects. Source that does not have an object will still be promoted.
- Enter N to promote objects and source as defined by the Default descriptions.

To enable this value, use Generate Defaults (X@GDFT) command for each Project.

**Request ignores source**

- Enter Y to retain existing development source members during a Request. If source does not exist, any production source will be copied into development.
- Enter N to copy source from production into development. If the member exists in development, a confirmation to replace the member will be displayed.

Allow Re-request PF/LF?

- Enter Y to allow Physical, Logical and Field reference files to be processed by the. ...Re-request command.
- Enter N if you do not wish to allow this feature.

X-Control	Parameter Maintenance	Databorough Ltd.
Type choices, press enter.		
Force Tested on Promote	N	(Y or N)
3=Create if completed	Y	(Y, N)
Promote Audit Pre-Check	N	(Y or N)
Where-Used XSEU	Y	(Y or N)
Promote pre-allocate	N	(Y, N, M=Message)
Extra archive levels	N	(N, 1-8)
RQS sequence source	N	(Y, N)
Object Name integrity	Y	(Y, N, R)
Split code integrity	N	(Y, N)
Send release via FTP	N	(Y, N)
Nbr of FTP retries	N	(1 - 9)
Request pre-check	N	(Y, N)
DBR pre check	N	(Y, N)
Compare source	N	(Y, N)

F1=Help F3=Exit F5=Refresh F6=Messages Bottom
F24=More keys

Force Tested on Promote

- Enter Y to force the Tested flag to be set to Y before any item may be promoted.
- Enter N to ignore the Tested flag.

3=Create if completed

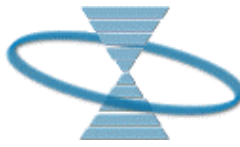
- Enter Y to allow creations for completed Status or Audit records.
- Enter N to disallow this.

Promote Audit Pre-Check

- Enter Y to activate the pre-check function. If this function is active, then before promotion to the live environment, a cross project check will be performed. The cross project check will verify whether, since this object was requested into development, it has been promoted back to live in another project. If so, promotion will not be possible unless OVRCHK (*YES) is specified on the promotion command. This function uses significant overhead when submitting a promotion: do not activate it if the 'Project/Object unique' parameter is N, or if not required.
- Enter N to deactivate the function.

Where-Used XSEU

- Enter Y if this environment works with the XSEU variant of X-Analysis. XSEU superseded the classical X-Analysis repository (X@LIST) in 1998.



- Enter N to if this environment is linked to the classical repository, if the project is not linked to an X-Analysis repository. Note that X-Control cannot mix classical and XSEU repositories.

Promote pre-allocate

- Enter Y to activate the object pre-allocation function before promoting. This function will attempt to lock all files in the target environments, before beginning to promote any objects. If any of the objects are in use, the promotion will not take place and an error message will be sent.
- Enter N to deactivate this function. Deactivating the function will require less overhead upon promotion.
- Enter M to deactivate this function, but send a warning message. If an object is in use, processing will continue, but a message XOM0504 will be sent to the user running the job.

Note that pre-allocation is active on full promotion jobs only. If you use the batch flow feature to re-run a promotion job that ended in error, this feature is not active.

Extra archive levels

- Enter a number from 1 to 8, to add extra archive levels. If extra levels are specified, X-Control will copy the archived object to the previous level library, before archiving the live object. The previous level library will be named aaaaaaaa_n, where aaaaaaaa is the initial archive library, and n the level.
- Enter N to deactivate this function. Only one level of archiving will be maintained.

RQS sequence source

- Enter Y to resequence source code when X-Control creates a development copy on Request.
- Enter N to deactivate this function. Source code will retain its sequence. The source code must then be manually resquenced by the programmer, or problems may occur upon multiple requests to the same source member.

Object Name integrity

- Enter Y to ensure that all *STMF objects sent via release distribution will have the same short name (alias) on the remote system. This function works by copying the status records into the release library and duplicate object libraries.
- Enter R to limit the copying of status records to the release library only, and not copy these records to duplicate object library.
- Enter N to deactivate this function. *STMF names will be calculated ndependently on the remote system.

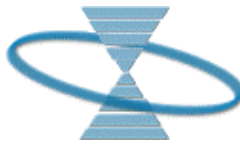
Split code integrity

- Enter Y to ensure that all objects sent via release distribution will be accompanied by their split code. Local split codes will be written to the remote system project.
- Enter N to deactivate this function. Split codes will be maintained independently on the remote system.

Send release via FTP**Nbr of FTP retries****Request pre-check**

- Enter Y to activate request pre-check reporting.
- Enter N to deactivate this feature.

If request pre-check reporting is active, before starting a request he system will check for three potential error conditions. The first condition is whether any related items are already requested.



The second condition is whether any related items exist in other projects. The third condition is whether any related items exist in the X-Repository cross-reference database, but are unknown to X-Control. If any of these conditions are met, one message per error is sent to the project owner defined on the project file.

DBR pre check

- Enter Y to activate the DBR pre-check feature.
- Enter N to deactivate this feature.

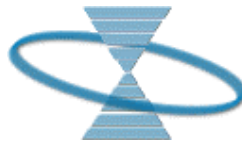
If the DBR pre-check is active, before starting an audit or release promotion, the system will check for any unknown database relations. An unknown database relation occurs when a physical file in an audit or release has one or more dependant logical files that are not contained in that audit or release. If this condition occurs, the promotion job is abnormally terminated, before any object activity has begun.

Compare source

- Enter Y to activate the source compare feature.
- Enter N to deactivate this feature.

If source compare is active, before promoting a source member to the live / production environment, X-Control will perform a comparison between the new version and the previous version. Differences will be written to a file in the live source library.

This feature will only record source changes for *PGM and *MODULE type objects. If source changes are to be recorded for any other object types, the XCMPSRC command should be run for those object types as a pre-processing before promotion to live.



Upgrading to a new release

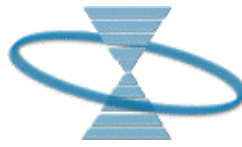
Please read carefully the Release notes and instructions for upgrading Change Management contained in the QXTSRC file within the X@MAN library.

Installation instructions are contained in members with names beginning INS.

Release notes are contained in members with names beginning VER.

It will be necessary to run the upgrade routines in sequence:

For example a user on version 1.95 upgrading to version 2.10 would need to run routines for 2.00 first followed by those for version 2.10.



User Guide - Database Projects

Definition

Database projects will contain Creation details for data type objects only - namely physical and logical files and data areas.

They will be able to request related items automatically from other programming projects - which are defined as Sub-projects of the Database project and which allow requests by another project. This will be achieved by means of the X-Analysis Where-used feature. These related items will be stored temporarily within the Database project but promoted back into their own projects as the database items are promoted.

Features

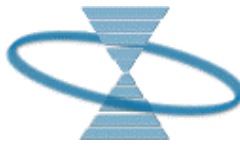
1. **Project Definition**
Allows definition of a single project for data base changes and multiple sub-projects for programming changes.
2. **Request Feature**
Allows the database project to request related items from the programming sub-projects automatically.
3. **User Security**
Provides a mechanism to restrict the level from and to which a user may promote an object type.
4. **Promotion Process**
Provides a mechanism to control the promotion of items from both the database project and program sub-projects so that changes from one do not overwrite changes from the other.
5. Automatic Re-creation of Dependent Objects
6. Allows changes made in the database project to be applied automatically on their promotion to all sub-projects at all levels except the development level.

Set-up Within X-Control

Parameters - Command X@MANP from command entry.

Specify the following:

- Stop Where used (X@RQS) - 'N' ensures related items are requested.
- Stop Where-used Promote - 'Y' because related items have already been requested it is not necessary to perform the Where-used on promotions.
- Stop Where-used Create - 'Y' because related items have already been requested it is not necessary to perform the Where-used on creations.
- Project/Object unique - 'Y' ensures creation details are unique to a project.



Database Project

Project Definition - Option 2 from Work with Projects Screen X@PRJ

Specify the following:

- Master Project - 'D' for Database.
- Sub-project of - blank
- Cross-project request - 'N'
- Cross-project promote - 'N'
- Cross-project create - 'N'
- Switch Environment - 0

Environment Definition - Option 8 from Work with Projects Screen X@PRJ

If the number of environments defined for the Database project is fewer than for the sub-projects the environments must be numbered in line with the sub-projects.

For example:

Sub Project Environments		Database Project Environments	
Development	1	Development	1
System Test	2		
Acceptance Test	3		
Wait Environment	4		
Operational Dev.	5	Operational Dev.	5
Operational	6	Operational	6
Archive	9	Archive	9

Project Application Linkage - Option 19 from Work with Projects Screen X@PRJ.

For each environment defined, specify a linkage to an X-Analysis application in one of the X-Analysis data libraries. The automatic import into X-Analysis should be 'Y' for the Production environment - 6 Operational in the example above.

Creation Details - Option 14 from Work with Projects Screen X@PRJ

Specify details of database type objects only:

- Physical Files
- Logical Files
- Data Areas

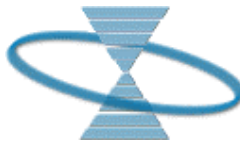
Note: Creation details must be unique between a Database project and its sub-projects. The Project/Object unique parameter will enforce this.

User Security

User Descriptions - Option 13 from Work with Projects Screen X@PRJ

- To add new Users - Option 1 from Work with Users Screen X@USR
- For existing Users - Option 2 from Work with Users Screen X@USR
- Maximum Promotion Level - Specify maximum level to which the user may promote.

User Restrictions - Option 14 from Work with Users Screen X@USR
- Option 1 from Work with User Restrictions Screen X@URC



- Environment - the 'To' environment to which the user may promote
 - Object type - specify blank to allow all object types or enter a specific object type.
- If User Restrictions are specified, promotions will only be allowed to the environments specified, up to the maximum promotion level defined in the user description. For example if a user is to be restricted to promote programs only from the System test environment (No.2) to the Acceptance Test environment (No.3) only, User Restrictions would be set up for program objects for environment No.3. The user would not be able to promote from environment 1 to environment 2 nor from environment 3 onwards.

If the user is to be allowed to promote from environments 1 to 2 and from environments 2 to 3, he will be defined for 'to' environments 2 and 3.

- Processing**
- Option 27 from Work with Projects Screen X@PRJ
 - To add new Processing
 - Option 1 from Work with Default Processing Screen X@DPP

This example will submit a Promotion for each Audit from environment 5, after each change of Audit during Promotion.

Specify the following:

- Object Type - *ADT
- Attribute - blank
- Environment - 0
- Process - A
- Action - Type
- Sequence - 1
- Command - SBMJOB CMD(X@PRMADT PRJ(&PRJ) RLS(&RLS) ADT(&ADT) ENV(5))
- Use F20 to enter.

This example will submit a Recreation of dependent objects within sub-projects for each change of Audit during Promotion.

Specify the following:

- Object Type - *ADT
- Attribute - blank
- Environment - 0
- Process - A
- Action - Type
- Sequence - 2
- Command - SBMJOB CMD (X@RECRTOBJ PRJ (&PRJ) RLS (&RLS) ADT (&ADT) FROMENV (2) TOENV (4))
- Use F20 to enter.

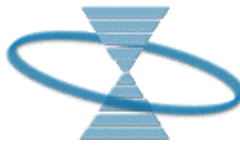
Pre and Post Processing have been implemented for Projects by Environment and Object type/attribute.

The values *RLS and *ADT may be entered as an Object type.

Pre- and Post processing may be simple command strings or Submit job strings.

Pre- and Post processing may have substitution for Project, Release, Audit and Object details.

- Submit Jobs**
- Option 22 from Work with Projects Screen X@PRJ



- Option 1 from Work with Submit Job Strings Screen X@SJS

This feature allows the user to define submit job details for a command, user and/or environment. The feature will be implemented in all Change Management prompter programs and for the Create Duplicate Library command within Promotion.

The following automatic defaults exist:

Command	String
X@AIXA	&CMDST
X@CRTDUPLB	&CMDST
X@CRTOBJ	SBMJOB CMD (&CMDST) JOB (&OBJ)
X@CRTADT	SBMJOB CMD (&CMDST) JOB (&ADT)
X@CRTRLS	SBMJOB CMD (&CMDST) JOB (&RLS)
X@PRMOBJ	SBMJOB CMD (&CMDST) JOB (&OBJ)
X@PRMADT	SBMJOB CMD (&CMDST) JOB (&ADT)
X@PRMRLS	SBMJOB CMD (&CMDST) JOB (&RLS)
Any	SBMJOB CMD (&CMDST) JOB (&CMD)

Note that X@AIXA and X@CRTDUPLB will run in-line without being submitted.

Create Duplicate Library command; this will now use a Submit job string, if available. This allows the step to be delayed until after the Promotion has been completed. A separate job queue may be specified as in the example.

The following entry allows this command to be submitted:

Command	X@CRTDUPLB
User	blank
Env	0
String	SBMJOB CMD (&CMDST) JOB (&CMD) JOBQ (OVERNIGHT)

Automatic Import to X-Analysis command, this will now use a Submit job string, if available. This allows the step to be delayed until after the Promotion has been completed.

The following entry allows this command to be submitted:

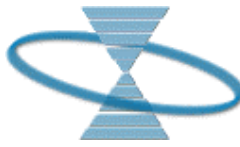
Command	X@AIXA
User	blank
Env	0
String	SBMJOB CMD (&CMDST) JOB (&CMD)

Sub-Projects

Project Definition - Option 2 from Work with Projects Screen X@PRJ Specify the following:

- Master Project - 'N'
- Sub-project of - Name of Database Project
- Cross-project request - 'Y'
- Cross-project promote - 'Y'
- Cross-project create - 'Y'
- Switch Environment - 5

For sub-projects the 'Switch Environment' will be the number the environment into which promotions from the database project will be returned.



The 'Wait' environment will always be the previous environment i.e. the switch environment number minus 1. In this example the wait environment will be number 4.

The 'Wait' environment is the number of the environment in the sub-project to which promotions from within the sub-project may be made if an item has also been requested by the database project.

The switch environment must be the same for each sub-project.

Environment Definition - Option 8 from Work with Projects Screen X@PRJ

If the number of environments defined for the Database project is fewer than for the sub-projects the environments must be numbered in line with the sub-projects. All sub-projects must have the same number of environments.

For example:

Sub Project Environments		Database Project Environments	
Development	1	Development	1
System Test	2		
Acceptance Test	3		
Wait Environment	4		
Operational Dev. (NL3)	5	Operational Dev. (NL3)	5
Operational (NL4)	6	Operational (NL4)	6
Archive	9	Archive	9

Project Application Linkage - Option 19 from Work with Projects Screen X@PRJ

For each environment defined, specify a linkage to an X-Analysis application in one of the X-Analysis data libraries. The automatic import into X-Analysis should be 'Y' for the Production environment - 6 Operational in the example above.

Creation Details - Option 14 from Work with Projects Screen X@PRJ Specify details of non-database type objects only i.e. object types other than Physical Files, Logical Files and Data Areas.

Note: Creation details must be unique across projects. The Project/Object unique parameter will enforce this.

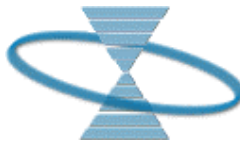
User Security

User Descriptions - Option 13 from Work with Projects Screen X@PRJ

- To add new Users - Option 1 from Work with Users Screen X@USR
- For existing Users - Option 2 from Work with Users Screen X@USR
- Maximum Promotion Level - Specify maximum level to which the user may promote

User Restrictions - Option 14 from Work with Users Screen X@USR
- Option 1 from Work with User Restrictions Screen X@URC

- Environment - the 'To' environment to which the user may promote
- Object type - specify blank to allow all object types or enter a specific object type.



If User Restrictions are specified promotions will only be allowed to the environments specified, up to the maximum promotion level defined in the user description.

For example if a user is to be restricted to promote programs only from the System test environment (No.2) to the Acceptance Test environment (No.3) only, User Restrictions would be set up for program objects for environment No.3. The user would not be able to promote from environment 1 to environment 2 nor from environment 3 onwards.

If the user is to be allowed to promote from environments 1 to 2 and from environments 2 to 3, he will be defined for 'to' environments 2 and 3.

Submit Jobs

The Automatic Import to X-Analysis Command (X@AIXA) should be specified as a Submit Job string as per the instructions for the Database project. This will be submitted automatically and so does not need to be specified as a Post-processing option. The Create Duplicate Library command X@CRTDUPLB should not be specified here - as it has already been specified in the Database project.

Set-up within X-Analysis

Where-Used Libraries

The X@WLBS command will be invoked to specify the additional Where-used libraries to be searched. The list is stored in the X@OBJ library. The list should include all X-Analysis data libraries to be searched - the same list is used regardless of which X-Analysis data library is being used.

Database Project

Importation of Files

If multiple X-Analysis data libraries are being used all physical and logical files must be imported into an application in each of the X-Analysis data libraries. The files must be imported using the X@PFEXTB command - accessible from command entry or from the Application Specification Screen - Import Physical and Logical files. The OBJMBR parameter must be *OBJLST for an Object List to ensure that dependencies between physical and logical files are correctly established.

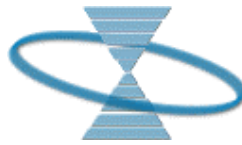
Project/Application Linkage

One of the data libraries with an application containing the files will be specified in the Project/Application linkage defined for each environment within X-Control - see above.

Sub-Projects

Importation of Files

If multiple X-Analysis data libraries are being used all physical and logical files must be imported into an application in each of the X-Analysis data libraries. The files must be imported using the X@PFEXTB command - accessible from command entry or from the Application Specification Screen - Import Physical and Logical files. The OBJMBR parameter must be *OBJLST for an Object List to ensure that dependencies between physical and logical files are correctly established.



Importation of Programs

All programs and non-database objects must be imported into an X-Analysis application within an X-Analysis data library. The database files must have already been imported into the application - see above.

Project/Application Linkage

The data libraries with an application containing the programs will be specified in the Project/Application linkage defined for each environment within X-Control - see above.

Using the System

Request Feature

When run from the database project the request features will do the following:

1. Check the project application linkage to determine the application X-Analysis data library.
2. From the application data library determine the additional libraries also to be searched.
3. Perform a where-used for the item on all the X-Analysis data libraries determined by 2 - to build the list of dependent objects.
4. From the list of dependent objects request the item first from the Switch environment of the sub-project. If it is not found here the environment will be incremented by 1 and the request tried again. If found the item will be requested into the development environment of the database project and marked with an active status within the database project/release/audit. The creation information will be used to determine from which project the item originates - the set of libraries to use will be ascertained from the project environment definition.
5. New items are those, which are found by the where-used within X-Analysis but which have not yet had creation information included within the database project or a sub-project. Creation information will be added to the database project automatically for such new items - then the item will be treated in the same way as in 4.
6. Creation information for a new item, which should belong to a sub-project, must be moved from the database project to its correct sub-project before promotion occurs. Option 15 from the Work with Creations Screen X@CRT performs this function.

Promotion Process

Promotion within Sub-projects

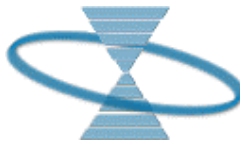
The promotion process will check that items from sub-projects have not also been requested by the database project.

If an object has been requested by the database project and still has an 'active' status in the database project, the object only be promoted as far as the wait environment in the programming project.

Explanation of 'Status':

As items are requested their status is recorded. This is visible by taking the following options from the Work with projects screen-

- Option 24 for Releases
- Option 7 for Audits
- Option 7 for Status



This displays the object status screen X@STS. The status will change as an item is requested, created or promoted from one environment to another.

Once the database changes have been returned to the sub-project and been promoted into the production environment of the sub-project the status of the program objects in the database project will change to 'complete'.

Before promoting from the wait environment in the sub-project a further check must also be done that the item has a status of complete at all higher environments.

This will ensure that the promotion of a database project change has gone through to the production environment. The items in the sub-projects may then be promoted from the wait environment to the switch environment and up into production.

Promotion from the Database project

Promotion of items from the Database project will take place in the following way:

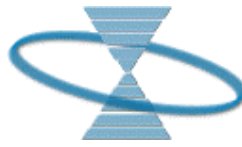
1. For each item the project to which it belongs will be ascertained by checking its creation details.
2. For items belonging to the database project: The source and object will be moved to the production environment of the project.
3. If the item belongs to a sub-project the switch environment number will be ascertained from the sub-project description. A check will be done for each object in its sub-project that it does not have an active status at the switch environment level or any level above this. If any object in any sub-project does have an active status the promotion will not proceed. If no objects have an active status all sources and objects will be moved from the database project to the switch environments of the objects' respective sub-projects.
4. By specifying the processing options and submit job strings in the set-up options above the Database changes will also be promoted within the sub-projects and reflected in the test databases at all environments except the development level within the sub-projects.

To summarise these will be:

- A post processing option of type *ADT submitting a promote audit command (X@PRMADT) - giving automatic promotion of audits sent from the database project into sub-projects - from the switch environment into production. A submit job string controlling the submit job parameters should be set up.
- A submit job string controlling the job to duplicate the test sets - X@CRTDUPLB. This job is already automatically submitted as part of the promotion process and so does not need to be specified as a post-processing option.
- A post processing option of type *ADT submitting a recreate objects command (X@RCRTOBJ) to recreate dependent objects in the sub-projects. Optionally the job may also have a submit job string specified to control its submission - it could be submitted to run immediately after the job to duplicate the test sets.

Automatic Re-creation of Dependent Objects

By means of the X@RCRTOBJ command dependent objects within the sub-project environments will be recreated when database changes are promoted. The development environment is excluded from this process.



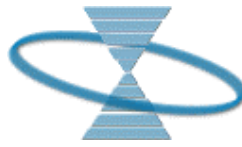
This job will be performed after the recreation of the test databases - it will be included in the Post-Promotion processing described above.

The X-Analysis 'Where-used' feature will be used to determine which objects are dependent on the requested object from the database project.

For physical files this includes their logical files and all objects, which are dependent on their logical files too. It will work as follows:

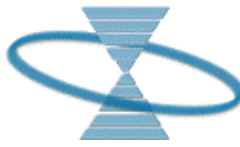
- Check the project application linkage to determine the application X-Analysis data library.
- From the application data library determine the additional libraries also to be searched.
- Perform a where-used for the item on all the X-Analysis data libraries determined above - to build the list of dependent objects.

By checking at which environments before the wait environment the object has an active status within its owning project the necessary re-compilations will be submitted. The stored batch processing information described above will be used to submit the job.



Set up instructions for *STMF objects

1. Set up defaults. At least one entry is required for OBTP = *STMF, OBAT = ' ', with CRTCMD = 'X@NULL'.
2. Set up environments. For each level, at least one entry is required for *STMF objects, with a directory such as /home/xcontrol/prod. Use only 'M' or 'D' as promotion methods. Additional entries can be made for different OBATs as required. You don't need to specify all OBATs in the defaults, unlike other object types.
3. Set up object descriptions. Either use X@RIFSD (F22) on the object display, or enter objects individually, giving a short name to each *STMF object. X@RIFSD generates the short name automatically.
4. Request, promote, re-request as usual. Pre and post processing are ok. You can use &STMF, &FRDIR, &TODIR, &RLSDIR as variables on default post processing commands (X@DPP).
5. If you want to use automatic release distribution, you should.
 - Set the release directory on the project description
 - Set the new 'IFS name integrity' parameter to 'Y' on all systems. This will ensure that the same short name is used across all systems.
 - Set up the correct *STMF environments & parameters on the remote X-Control, as above.
6. The WRKOBJPDM options run the WRKLNK command for *STMF objects.



Frequently Asked Questions

Q. We develop multilingual software so the printer files etc have to be compiled over the correct message files for the country. What I need to do is when an object is promoted to live it is compiled twice. Once into the live library/release library. But for a second time over an alternate read only library list i.e. a third library at live. Is there any way I can do this is X-Control?

A. There are many ways to do this, but all require post-processing, and the final choice is a matter of preference. Set up is a bit complicated, but once done, processing is fully automatic. Here are three methods.

1. Create a separate project

A separate project containing only PRTFs is set up. The set up is unusual:

- The project requires only one environment level
- The source library is the same as the original project, the object library and read libraries are different
- Only PRTF objects are retrieved into the PRTF project
- A permanent 'dummy' audit is built, containing all PRTFs. The status records of this audit are built by reading the X@CRT records for the project, and then writing a record to X@STS for each X@CRT. You can use either SQL, or the X@ADDSTS command in a CL program, taking care to specify all required values.

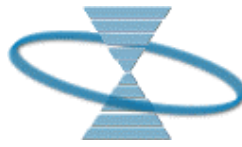
Then, a default post process is set up in the original project, for all *FILE PRTF objects. This post process submits an X@CRTOBJ command for the object, in the PRTF project/audit. This will compile the PRTF separately, in the correct library, with the correct library list.

2. Set up the original project to point at the foreign language (FL) PRTF library

- Set the object library for *FILE PRTF object to the FL library.
- Add a post process entry for *FILE PRTFs, after promotion to the live environment, to call a CL program with all required parameters. This program will:
 - Move the new object from the FL library to the standard object library with the X@MOVOBJ command
 - Override the message file to the FL library (OVRPRTF).
 - Recompile the object with the X@CRTOBJ command (it will compile in the FL library again).
 - Delete the message file override (DLTOVR).

(NB: this assumes that the standard object library is above the FL library in the library list, which should be the case)

4. Ask IBM to include the MSGID keyword in PRTF coding, as per DSPF coding!



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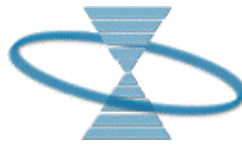
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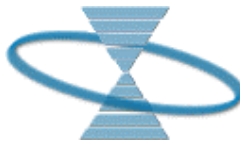
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