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CA - 7

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Introduction

What is CA-7?

CA-7 is scheduling tool and its a Production control system. It's an online, real-time, interactive system which automatically controls, schedules jobs based on the Date and time, job dependencies and available resources or time-driven and/or event-driven activities.

- Jobs
- Scheduling
- Requirement Definitions

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Introduction (Cont.)

Functions of CA-7

- Provides Online Scheduling facility
- Selects job for execution
- Submits jobs
- Tracking jobs
- Analyzes job execution results

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Introduction (Cont.)

Batch Cycle:

✓ Sequencing of Jobs to run in order is called Batch Cycle.

✓ Here Successive Jobs are initiated automatically when the previous Jobs are completed and all requirements are satisfied.

The initiation of the job is done in two ways:

✓ **Time Based:** Jobs run based on the time specified in the Job.

✓ **Event Based:** Jobs are dependent on other Jobs and run only when they are completed.

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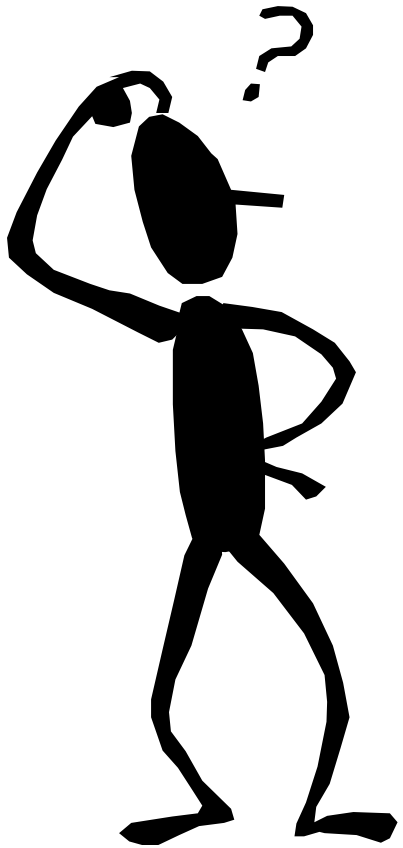
Before CA-7 ???



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It's

Control - M

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Advantages of CA-7 compare to Control-M

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Procedures

Without CA-7

- Create the JCL for your job and move it into production
- Fill out a job information form or member that contains the desired schedule, requirements and follow-through for this job.
- Give this information to Operations to add to the daily schedule.
- Operations manually verifies if the datasets were created and all prerequisites completed
- Job is then submitted at the proper time in the correct sequence
- At Job completion, output must be reviewed for good completion codes.

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Procedures (Cont.)

With CA-7

- CA-7 automatically reads in your job and stores a copy in its staging area(Trailer Queue) at the appropriate time.
- CA-7 then attaches the predecessor requirements (i.e) Start time, dataset dependencies, job predecessors etc.
- When all are satisfied, CA-7 submits your job to MVS and reports back with completion status

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Topics Covered in this Module

- Logging on to CA-7
- Defining a Job to CA-7
- Understanding CA-7 Calendars and SCHID
- Understanding the Schedule Scan(SSCAN)
- Scheduling a Job in CA-7
- Building Job Relationships

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Definitions

Schd Id: A job can be a part of different batch cycles. To run the same job in different batch cycles, we use schid.

- ✓ Schids can be any number between 1-255.
- ✓ Every job running in CA7 Should have a Schid.
- ✓ Schid is very important when triggers are on.

Dead line Time: It is the time by which the Job should meet the requirements and should start successfully.

Due Out Time: It is the time before which the Job should complete successfully.

Elapsed Time: Average time of last five successful runs of the Job is called Elapsed time and is calculated by CA7.

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Definitions (Cont.)

Submit Time: It is the time where the Job should get submitted to the Operating System.

Lead Time/ Look Back Time: It is the time where we can look back for the execution of the Job in the previous run where we can post the requirements if they are met. Lead time varies from 0 to 99.

- 0 → Indicates no lead time is to be considered when satisfying this job's requirements.
- 98 → maximum lead time value is 98 hours.
- 99 → Each predecessor job must complete normally while this job is in the request queue. This is a special case, even though it is equivalent to zero lead time. Because, the requirement is never to be considered as already satisfied when the job enters the queues.

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Definitions (Cont.)

Restart: The term restart is interpreted as restarting the job in the step in which it has failed. We can even restart from any other step also.

Restarting a Job in CA-7: Insert the restart card in JCL and resubmit it in xqm panel.

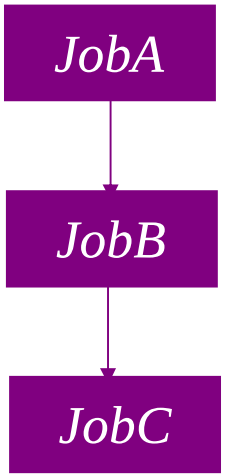
Restarting a Job in CA-11: In Ca11 the step where the Job has to start is already tracked and we have to restart it from xqm panel. But we can even change the step name from where it should be started.

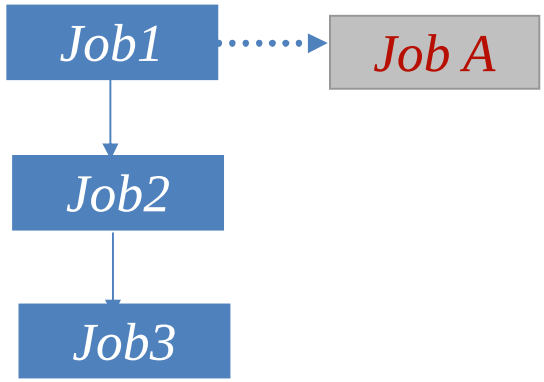
Trigger : Used to describe relationships between jobs in the same schedule. For example, job1 can trigger job2. Job2 is then described as having been triggered by Job1.

Definitions (Cont.)

Trigger : (Cont.) In the given example for Job2, Job1 is called the Predecessor Job and Job3 is called as the Successor Job.

Dependencies: In the above example Job1 has an internal requirement of Job A and Job1 will get posted only when Job A runs successfully. Hence Job1 is said to be dependent on Job A.





Stand Alone Jobs: Jobs which do not trigger any other Jobs are called as Stand Alone Jobs. The above example Job C is called Stand Alone Jobs.

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Definitions (Cont.)

RESTART: The term restart is interpreted as restarting the job in the step in which it has failed.

RE-RUN: The term re-run is interpreted as re-running the job from the top, or first step of the job. RESUBMIT and RE-RUN have the same meaning.

Other common terms include -

SCHID: A schedule or job stream can have many different variations. Each variation is called a schid or schedule id. For example, Job1 may trigger Job 2 on schid 1, but on schid 3 Job 1 may trigger Job 3.

HOLD: A job can be placed on hold before or after it enters the CA-7 queue. The job will remain in hold, meaning it will not run, until the hold is removed.

OVERRIDE: Sometimes it is necessary to modify the regular JCL (referred to a the MASTER JCL). In such cases the term used is OVERRIDE. This process can be done prior to a job executing or after a job has failed, and recovery requires modification to the JCL.

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Common CA-7 Terms & Definitions

When a job enters into the CA-7 queue it can complete normally, execute and fail, or wait in the queue until all requirements are satisfied. For jobs that execute and fail the operator can take these actions.

- **FORCE COMPLETE**: A failed job is marked within CA-7 as a normal completion. Jobs waiting for the successful completion of this job will now run - if all other requirements of the job are satisfied.

- **CANCEL:** A failed job is removed from the CA-7 queue. Jobs waiting for the successful completion of this job will not run unless the requirement for the failed job is manually satisfied and if all other requirements of the job are satisfied.

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CA-7 Queues

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CA-7 Queues

Why the queues needed?

- Monitor and control the production workload
- Allow rapid access for changes

What is in the queues?

- Jobs and stations scheduled, submitted or active
- JCL and requirements for jobs
- Job history information
- Work space for editing and sorting

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Queue Types

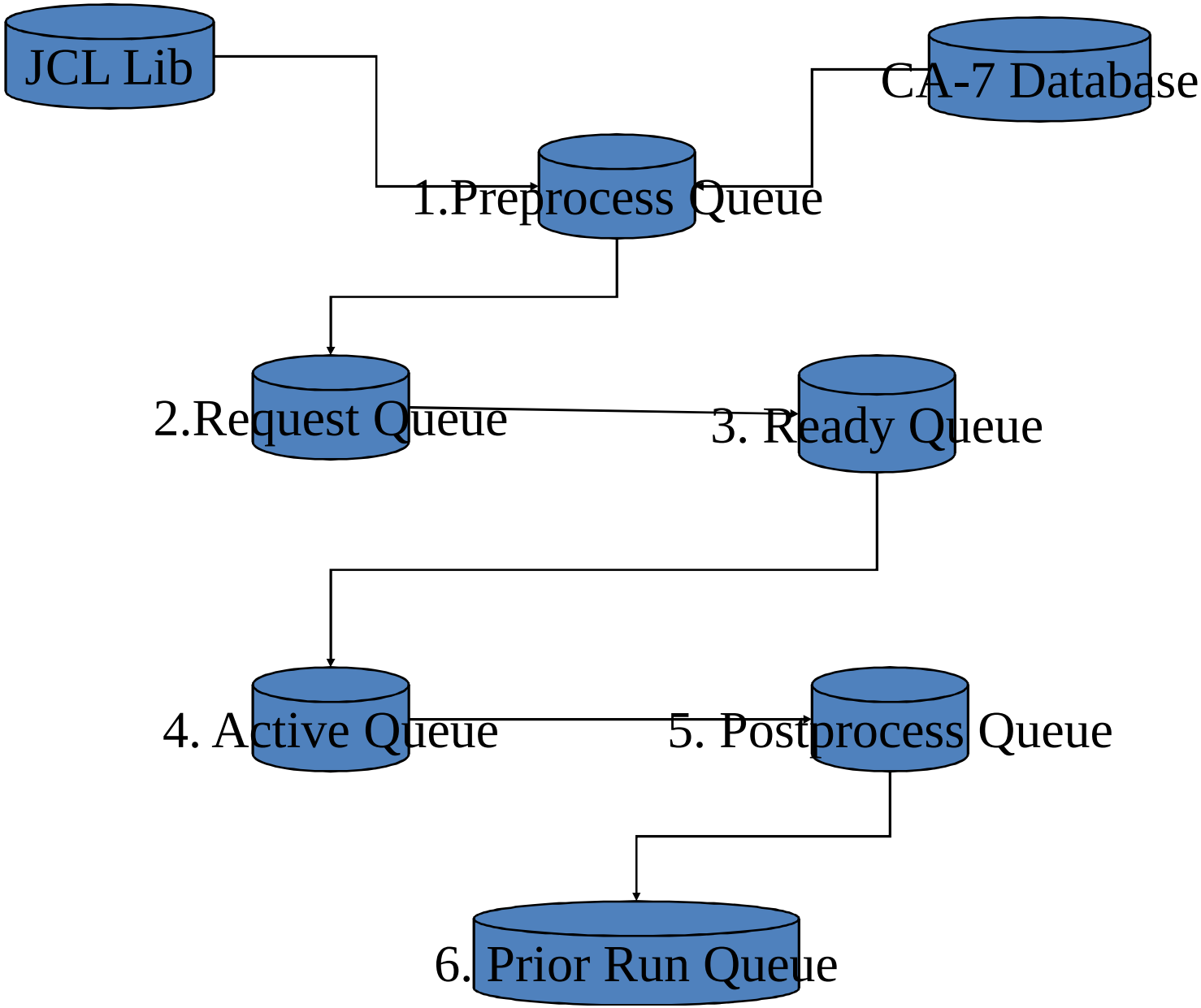
1. Status Queue

- **Request**
- **Ready**
- **Active**
- Prior-Run
- Pre-process
- Post-process

2. Work Queue

- Trailer
- disk-Queue-Table
- Scratch

Steps in Normal Queue Flow



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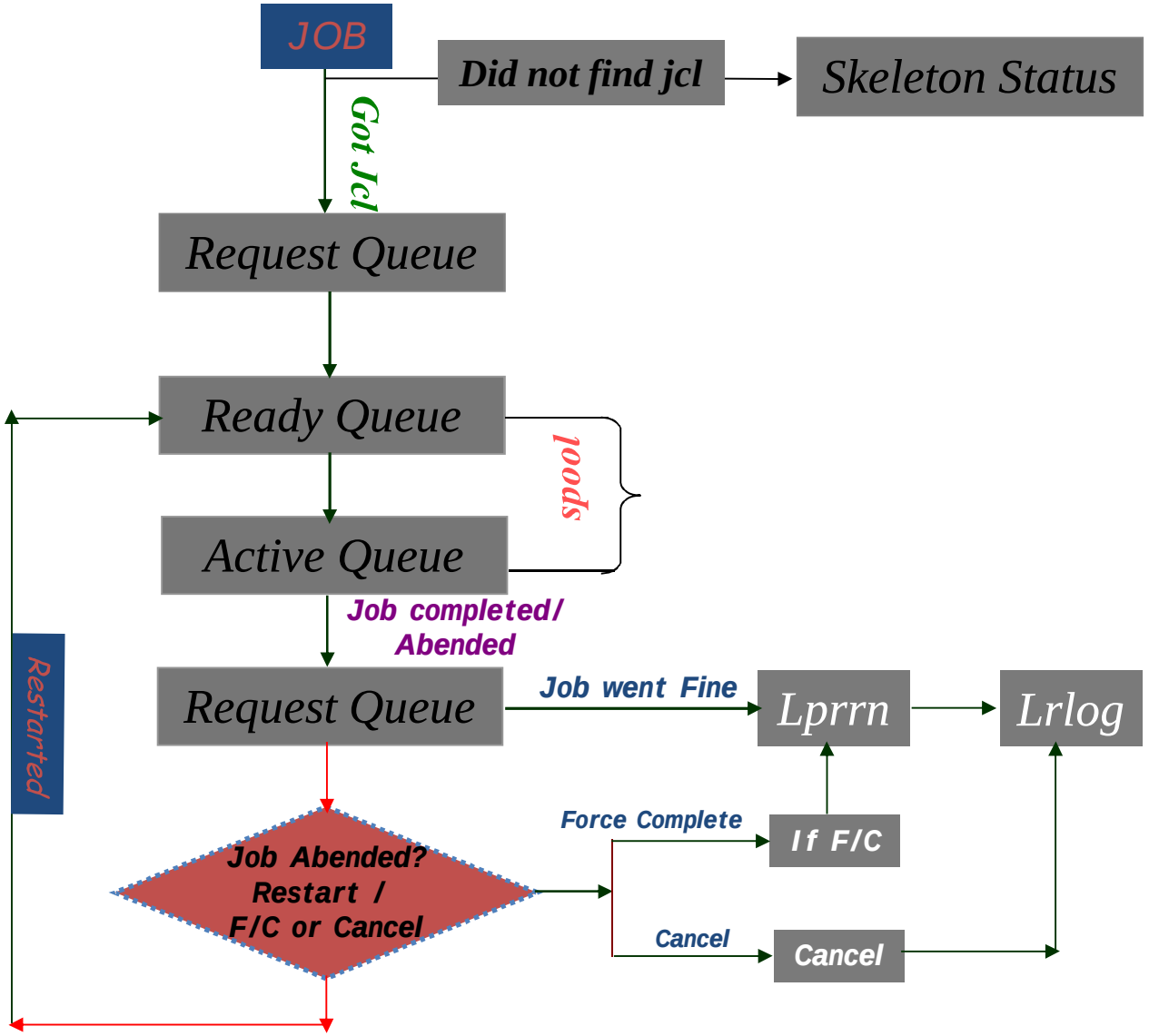
Entire Job Flow



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Request Queues

- Once the job is triggered by the predecessor job, it first comes into the request queue and waits until it meets all the requirements.
- When job comes into the request queue with a unique CA7-id and it is same until it is successfully completed or thrown out of all the Queues.
- The jobs which are abended also comes into the request Queue with abended status.
- There are five ways by which the jobs come into the Request Queue
  1. Sscan (scheduled scan)
  2. Auto.
  3. Demand.
  4. Run.
  5. Load.

Request Queue

Lq,job=job name

Lreq,job=job name

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Request Queues (Cont.)

Demand Command:

Used to force immediate scheduling of a job into the CA-7 request queue.
Syntax: Demandh,job=<job name>,schid=<schid>,set=ntr.

- The above command is to demand a job with no triggers.

To demand a job which needs to be restarted from a particular step.
Syntax: Demand,job=<job name>,schid=<schid>,type=res

Note:

- Always cross check the SCHID and trigger option before demanding the job.
- Default schid is 001 and with triggers.
- It is always safe to demand a job with hold.

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Request Queues (Cont.)

There are three ways to remove the jobs from the Request Queue.

- **Force complete:** Force complete will not only mark the status of the jobs in the request queue as complete but also triggers the successor jobs.
- **Cancel:** This command is used to remove the jobs from CA7 request Queue.
  - **Syntax:** Cancel,job=<ca-7- id>,Reason= <text>,force=yes
- **Restart:** This command is used to restart the job from CA7 request.

Note:

- Cancellation of the jobs in the Ready Queue or active queue does not cause termination of the jobs execution.
- Using cancel command not only removes the job from request queue but also it doesn't trigger the other jobs.

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Ready Queues

- Once the job meets the requirements, the jobs moves from the request queue to Ready Queue.
- Normally jobs will not wait in the Ready Queue for a long time.
- Different Scenarios where jobs held up in the Ready Queue are:
  - Contention
  - Initiators are not free
  - Jobs with incorrect syntax will hung up in the Ready Queue.

Ready Queue

LRDYP

LRDY

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Ready Queues (Cont.)

- When the job is in the Ready Queue, CA-7 will not release the job from the Ready Queue to Spool until it gets all the resources.
- If the job is hung up in ready queue for a long time,we will move the job from the ready queue to the Request Queue.
- We use Requeue command to move jobs from ready queue to Request queue,
  - **Syntax: Requeue,job=(job name/job no),Q=(rdy)**

Note:

Don't use Requeue Command when the job is submitted to spool, as it creates one more instance of the job in the Request Queue.

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Active Queues

- Once the Jobs meets all the requirements and gets all the resources it requires, jobs will move to the Active Queue.
- Once the jobs are in the active queue, CA-7 doesn't have control on the jobs and to analyze the jobs in the active queue we need to go to SPOOL.
- OS controls the job once it starts on the system, CA-7 captures job status coming from the system.

Active Queue

LQ

LACT

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Logging on to CA-7

```
----------------------------ELECTRONIC DATA SYSTEMS----------------------------

CA-7.023 LOGON ACCEPTED, PRESS ENTER FOR MENU OR ENTER COMMAND



USERID      :  DZ2V5K       TERMINAL NAME : VTM003       DATE  : 02.233
                            VTAM APPLID   : UCC7         TIME  : 06:00:06
                            LUNAME        : CA710003     LEVEL : V3N3 (0110)


                  CCCCCCCCCCC  AAAAAAAAAA       77777777777
                 CCCCCCCCCCCC  AAAAAAAAAA      77777777777
                CCC          AAA    AAA             7777
               CCC           AAAAAAAAAA   0000      7777
              CCC            AAAAAAAAAA   0000     7777
             CCC            AAA    AAA            7777
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                          COPYRIGHT (C) 1988, 2001
                    COMPUTER ASSOCIATES INTERNATIONAL, INC.
```

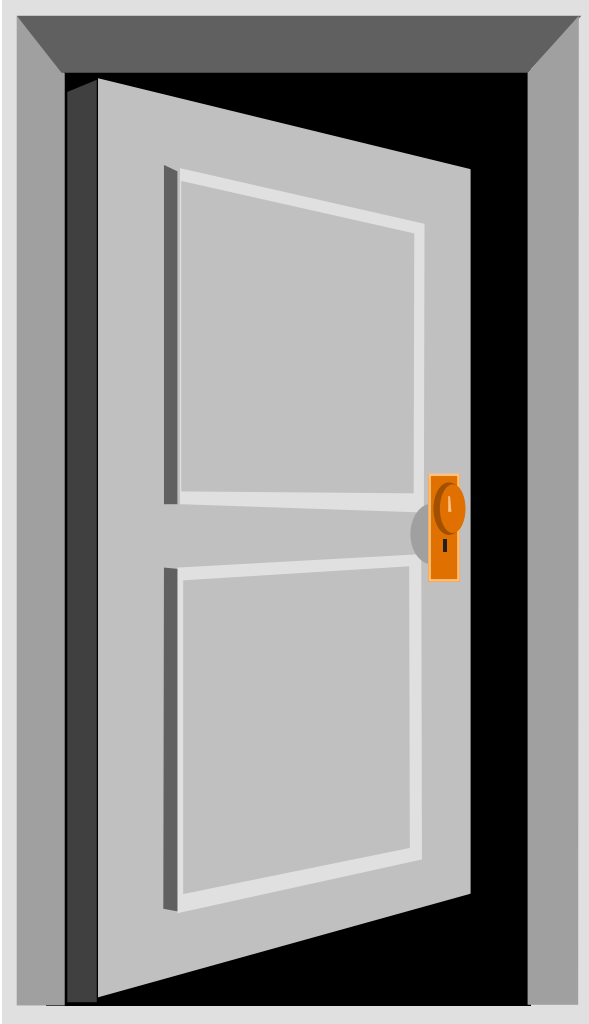

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Job Definition

The following are the steps needed to add a job to CA-7:

1. Collect necessary data on job

2. Define job to CA-7

3. Load the job

4. Define job schedule

5. Define predecessors

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Collect Necessary Data

- JCL library containing the JCL
- Schedule Information
- Predecessor Requirements
- Rerun instructions
- Job Information
  - System name
  - Condition code testing
  - Ownership/Security
  - Execution requirements

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Identifying the Database Menu

CPU Job Definition Panel

Job Definition Panel Parameters (Cont.)

```
------------------------  CA-7 CPU JOB DEFINITION  -------------------------
FUNCTION:              (ADD,DELETE,DD,DELPRRN,FORMAT,LIST,UPD)
JOB:
GENERAL:                 SYSTEM:              JOBNET:              OWNER:              UID:

JCL:                     ID:        MEMBER:              RELOAD:      EXEC:      RETAIN-
JCL:
                         LIB:
REQUIREMENTS:   HOLD:      JCL-OVRD:      USE-OVRD-LIB:      VERIFY:      MAINT:
                         SATISFACTION LEAD-TIME:  JOB:       DSN:       ARFSET:

EXECUTION:            MAINID:         INSERT-RMS:      COND-CODE:         RO:
                         DONT SCHEDULE -- BEFORE:                AFTER:

MESSAGES:              LTERM:              REQUIREMENT-LIST:      PROMPTS:
                         ERROR MSGS -- RQMTS NOT USED:      DSN NOT FOUND:

RESOURCES:            REGION:         CLOCK-TIME:         CPU-TIME:
                         CLASS:      PRTY:          MSGCLASS:
                         TAPE DRIVES...TYPE1:       M       C   TYPE2:       M       C

PROGRAM:            MSG-INDX:  00     -- DB.1      --   99.166  / 10:56:47
MESSAGE: ENTER FUNCTION, TRANSFER OR ENTER A COMMAND ON THE TOP LINE
```

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Job Definition Panel

- **ADD -** to add a new job to the CA7 Database
- **DELETE** - deletes a job and its data from the database
- **DD** - same as delete also deletes datasets and virtual resources from the CA7 database
- **DELPRRN** - deletes the JCL saved in the Trailer Queue from the job's prior run.
- **FORMAT** - clears the screen of all input data
- **LIST** - lists the information about a specified job
- **UPD** - to update/change the database information about the existing job

Job Definition Panel Parameters

General :

Job - The job name on which the functions is to be performed

System - User defined application system name

Jobnet - Name of the CPU job network

Owner - User-id for ownership of this job

UID - CA7 user security identification(0-255) Default=0 (No security protection)

Job Definition Panel Parameters (Cont.)

JCL Section

ID - JCL Library Identification(0-253)

(254-Override Library; 255-Help Library)

Member - JCL Lib. Member name(Job Name)

Reload - Indicates if this job's JCL is to be reloaded
Values : Y, N or X (Default : N)

Exec - Indicates whether this job should execute (Default : Y)

LIB - Override JCL Library -Default blank

Job Definition Panel Parameters (Cont.)

Requirement Section:

Hold - The job to be in hold (Default -N)

Jcl-ovrd - Requires a manual override (N)

Use-ovrd-lib - To use JCL from the override library(Jcl-ID 254)(N)

Verify - Indicates whether this job requires any presubmission manual verification.

(Default N)

Job Definition Panel Parameters (Cont.)

Requirement Section:

Maint - Indicates whether this job is a maintenance job(Ex. System utility) with no production dataset requirements (Deft=N)

Satisfaction Lead-Time - Number of hours to be considered when satisfying dependent requirements like **Job, DSN**

ARFSET - ARF definitions in the ARF database.(Default is Blank)

Job Definition Panel Parameters (Cont.)

Execution Section:

MainID - Defines the CPU the job may/may not run. (Default :ALL)

InsertRMS - 'Y' means the CA11 RMS step will be automatically inserted at execution

Cond-code - Used with RO to define Cond. Code testing at job level (0-4095)

Job Definition Panel Parameters (Cont.)

Execution Section:

RO - Relational Operator of the Cond Code

(EQ, NE, LE, GE, LT, GT, etc.)

Don't Schedule - **Before** -the job will not be scheduled before this date and time (yyddd hhmm- 00000 00000).

After- the job will not be scheduled after this date and time (yyddd hhmm- 99999 00000)

Job Definition Panel Parameters (Cont.)

Message Section :

LTERM - The logical terminal to receive messages about the job.

Requirement-list - pre-requirements for the job will be sent to LTERM

Prompts - Identifies the prompt message sent to LTERM(ex: if the job is late)

Error Msgs - Requirement not used and DSN not found

Job Definition Panel Parameters (Cont.)

Resources Section:

Region - Region size required for the job (D-0)

Clock-Time - Average run time(HHMM) used for deadline prompting and forecasting.

CPU Time - Average CPU time(MMMSS) used by workload balancing.

CLASS - Workload balancing class for the job

PRTY- Workload balancing initial queue priority(0-255)

MSGClass - JES message class for the job

Job Definition Panel Parameters (Cont.)

```
CA-7 CPU JOB DEFINITION  -------------------------
  FUNCTION:  LIST       (ADD,DELETE,DD,DELPRRN,FORMAT,LIST,UPD)
  JOB:  YSRWCP2
  GENERAL:               SYSTEM:          JOBNET:            OWNER:  DSR000     UID:  0

  JCL:                       ID:  145   MEMBER:  YSRWCP2    RELOAD:  N   EXEC:  Y   RETAIN-JCL:  N
                               LIB:
  REQUIREMENTS:    HOLD:  N   JCL-OVRD:  N   USE-OVRD-LIB:  N   VERIFY:  N   MAINT:  N
                               SATISFACTION LEAD-TIME:  JOB:  0    DSN:  0    ARFSET:

  EXECUTION:    MAINID:  SY1    INSERT-RMS:  N   COND-CODE:  0      RO:  NE
                           DONT SCHEDULE -- BEFORE:  00000  0000   AFTER:  99999  0000

  MESSAGES:     LTERM:  MASTER     REQUIREMENT-LIST:  Y   PROMPTS:  N
                           ERROR MSGS -- RQMTS NOT USED:  Y   DSN NOT FOUND:  Y

  RESOURCES:    REGION:  960    CLOCK-TIME:  0004   CPU-TIME:  00004
                            CLASS:  A   PRTY:  000     MSGCLASS:  Q
                            TAPE DRIVES...TYPE1:  000  M  000  C   TYPE2:  000  M  000  C

  PROGRAM: SM20     MSG-INDX:  00     -- DB.1      --   99.166  / 11:01:09
  MESSAGE: LIST SUCCESSFUL
```

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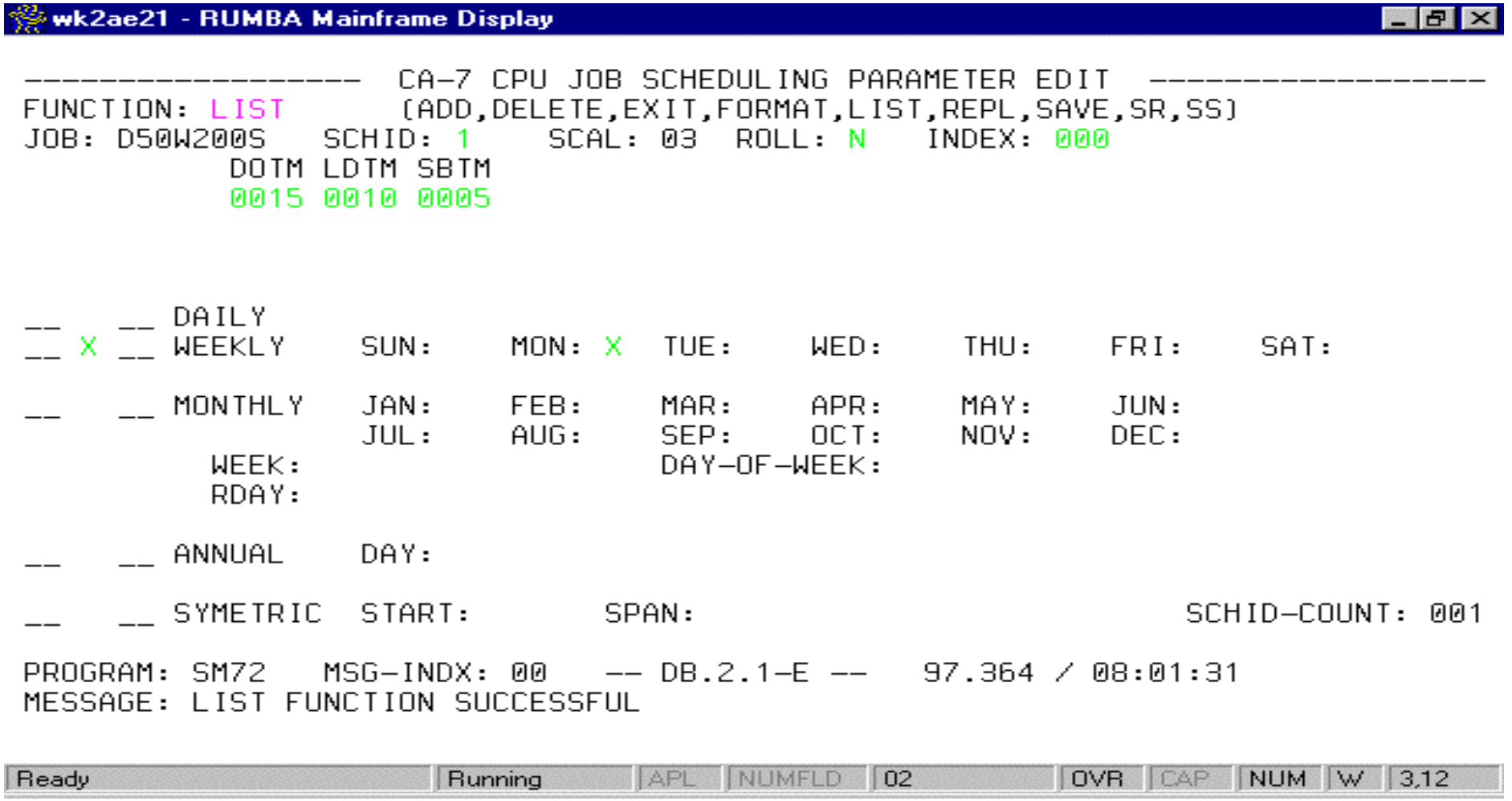
Job Scheduling Panel

Job Scheduling Panel

- Calendars
- Schedule ID's



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Calendars

- Define processing and non-processing days
- Define relative days
- Define beginning and ending of month
- Define calendar year and unique name
- Calendar names composed two alphanumeric characters.
- Command: **PRINT,SCAL=xx,[YEAR=yy]**

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Schedule - ID’s

SCHID’s are used to document the scheduled processing days for CA7 jobs.

Job runs daily (Mon - Sat)	30
Job runs Monday only	31
Job runs Tuesday only	32
Job runs Wednesday only	33
Job runs Thursday only	34
Job runs Friday only	35
Job runs Saturday only	36
Job runs Sunday only	37

Job Scheduling Panel - Functions

- **Clear -** Clears all entered fields
- **Delete** - Deletes the CPU job definitions
- **Edit** - Permits updating done on CPU
- **Fetch** - Displays the info. for a given job
- **FE** - Combination of Fetch and Edit
- **Repl** - Updates the schedule information for the specified job
- **Resolv** - Resolves the schedule requested for a given job for a given period of time.
- **Save** - Adds new schedule for a specified job

Job Scheduling Panel - Parameters

- **JOB** - Permits the additions of a schedule for a given CA7 job
- **SCAL** - Provides for a calendar to be used

Maintec Job Scheduling - Edit Panel

Functions

- **Add -** Addition of a schedule for a given job
- **Delete -** Deletes given schedule
- **Exit** - Returns DB2.1 without saving data
- **Format** - Clears the screen of user input data
- **List** - Displays all the existing SCHID's with one per screen
- **Repl** - Replace an existing SCHID
- **Save** - Stores a new SCHID and data
- **SR** - Save and Replace;
- **SS** - Save data

Maintec Job Scheduling - Edit Panel

Parameters

- **Job** - The job name which the schedule is being created, updated or deleted
- **SCHID** - The numeric schedule identifier
- **SCAL** - Calendar to be entered for the schedule to be built
- **ROLL** - Specifies the action to be taken when a schedule day falls on non-pross.day
  - **B** -- roll back to previous processing day
  - **D** -- do not roll and do not schedule
  - **F** -- roll forward to next processing day
  - **N** -- do not roll and run in scheduled day
- **INDEX** - Specifies an adjustment to schedule days and is used with the ROLL
- **DOTM -** Due out time for specified SCHID (Required for ADD and REPL only)
- **LDTM -** Lead time for specified SCHID. Amount of time necessary to ensure job completes before its DOTM. Required for ADD and REPL only
- **SBTM** - Submit time for specified SCHID