

**Chapter
2**

**VSE / POWER
SYSTEM**

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Objectives

You will learn:

- C VSE/POWER operation.
- C Queues, classes, and devices.
- C Job disposition.
- C Remote Job Entry and CPU to CPU communications.
- C Job accounting.
- C Reader Exit
- C Shared Spool Facility.
- C Commands: Operator, Task Management, and Control.

1 VSE/POWER: Overview

POWER stands for Priority Output Writers, Execution processors and input Readers. It is supplied along with the VSE system and must be generated to include the facilities required by an installation. The spooling system supplied as part of VSE is VSE/POWER.

It is based on the principle that all jobs are divided into job entries and considers that the card input, both data and job control, the executable DOS/VSE job (or several DOS/VSE jobs), the card output and the printer output each form a discrete entry. This means that each entry, whether input, job or output, can be handled or controlled separately.

The flow of a typical job through a system is as follows:

1. Operator loads job into card reader or submits job from ICCF.
2. VSE/POWER reads the job into the reader queue.
3. The job is processed in a partition and output, both print and punch, is placed in the printer and punch queues.
4. After the job is completed the punch and printer output is available for VSE/POWER TO PROCESS TO REAL OUTPUT DEVICES.
5. The output is printed and punched on the appropriate physical devices.

There could be delays at any stage due to jobs already being processed in the partition or another job being printed on the printer.

At each stage the operator can control job entries by operator commands and some of these can be carried out by including VSE/POWER control macros in application programs. Each job can also be controlled by using Job Entry Control Language (JECL) in the job stream.

VSE/POWER has additional facilities available which include:

- C Job Accounting
- C Remote Job Entry/Network JOB ENTRY
- C Programming Interface, including Reader Exit
- C Shared Spool Facility

1.1. VSE/POWER Operation

VSE/POWER runs in a VSE partition. It is generally started as part of the IPL procedure and it can control all other partitions. The number of partitions controlled by VSE/POWER is selected at startup but it is possible to vary this while running. The VSE/POWER partition must have a higher despatching priority than the partitions it controls and it prevents the operator using the PRTY command to lower its priority.

If an installation needs to run a partition at a higher priority than VSE/POWER, this partition cannot be under VSE/POWER control. VSE/POWER can use most unit record devices supported by VSE.

VSE/POWER will accept input from the following devices:

- C Local card reader
- C Local diskette reader
- C Remote job entry terminal
- C Another partition (e.g. ICCF)
- C Tape drive
- C Another VSE/POWER system, or MVS system.

VSE/POWER can produce output for the following devices:

- C Local card punch/or printer
- C Remote job entry terminal
- C Another partition (e.g. ICCF)
- C Another VSE/POWER system
- C Tape drive

Except for input and output to and from another partition the above operations are controlled by operator commands and Job Entry Control Language (JECL).

VSE/POWER uses disk files for intermediate storage and also, optionally, tape for output intermediate storage. VSE/POWER uses two disk files and, if the job accounting option is included, a third for job accounting records. The two disk files are the Data File and the Queue File and both must be online when VSE/POWER is running. The Data File may use one or more physical extents.

The Queue File and the Data File must be large enough to handle the information spooled at any time.

If the Data File fills up, an operator message (IQ38I NO DASD SPACE ...) is issued. The operator must release space by either printing jobs or deleting entries. It is possible to monitor the available space by using the DISPLAY command.

One way of increasing spool capacity without increasing disk file is to use a magnetic tape as intermediate storage. This can be processed by VSE/POWER and printed on a real printer without any disk storage being used.

1.2. Queues, Classes and Devices

Although there is only one Queue File and Data File it is logically divided into various queues.

There are 5 queues and these are again divided into classes.

The 4 queues are:

- C Reader Queue
- C List (or Print) Queue
- C Punch Queue
- C Transmit Queue

The classes are single character and are A to Z for all queues with the reader queue having an additional 10 from 0 to 9. Every job entry has a class associated with it and these classes are used by VSE/POWER for both tasks and queue management. Also associated with each job entry are various attributes (e.g. priority (within class), whether the job entry is held, etc.) and these are discussed in the Job Entry Control Language segment.

Each VSE/POWER controlled partition has logical (or dummy) unit record devices and classes allocated when it is initiated. The dummy unit record devices can have the same physical addresses as the real ones or can be different as long as these addresses have been included in the IPL procedure.

There is one card reader allocated to each partition and up to eight printers and eight punches. In a similar way, classes are allocated to partitions and up to four classes can be allocated to each partition. Classes can be partition dependent (e.g. 0=BG, 2=F2 etc.) or partition independent (e.g. Class P can be allocated to all partitions). Jobs read in a reader have a class associated with them either from a JECL statement or from the reader's default class which is allocated when the reader is started.

When a printer or punch is started the operator associated between one and four classes to it and only job entries with those classes will be printed or punched.

VSE/POWER uses a combination of class and other attributes to schedule and run jobs in a system.

This can be seen by the following list of jobs on a reader queue in the order they were loaded:

JOB NAME	CLASS	PRIORITY
SEL99	T	1
LIBUPD	G	8
RSMDSPY	B	4
LINK2	0	8
LINK7	0	6
FASTCOPY	B	1
DEFAULT	A	3

If the background (BG) partition was started with classes B, 0 and T and a foreground partition (F8) started with classes B,S,G and T the jobs would be run in the following order:

BG	F8
RSMDSPY	FASTCOPY
LINK7	LIBUPD
LINK2	

Job SEL99 would run in the partition that finished all other jobs first, and DEFAULT would not run at all.

1.3. Job Disposition

Each VSE/POWER job has a disposition which indicates whether the job is to be processed immediately, to be held, or to be processed and kept on the queue for future use.

There are four dispositions:

D	Process and delete.
H	Hold on the queue.
K	Process and then hold on the queue in disposition L.
L	Leave on the queue.

1.4. Remote Job Entry and CPU to CPU Communications

It is possible to use RJE: remote job entry terminals with a VSE/POWER system. Both BSC and SDLC devices can be used. Normally, a RJE terminal consists of a card reader and printer but a diskette reader or console can also be attached.

VSE/POWER treats these devices as additional unit record devices and there are some minor differences when using RJE as part of VSE/POWER, including the following:

- Each location is allocated an ID number. The central site is always 0; the remote sites start at one and are incremented by one for each additional terminal. There is a maximum of 200 terminals that can be included in a VSE/POWER network (unless it is an SNA network).
- Operator commands, JECL and messages include parameters for RJE operation.
- Output can be sent back to the originating site or routed to another.
- Operator commands can be submitted from RJE terminals either using remote consoles (SDLC only) or cards.

In a similar manner two DOS/VSE systems can be joined using a BSC or SNA/SDLC (VTAM) link between them. Jobs and operator commands can be routed between the two systems.

2 Job Accounting

Job Accounting support can be included in VSE/POWER. It collected information from the DOS/VSE job accounting interface and from VSE/POWER itself.

There are five record types:

- C Reader account record.
- C List account record.
- C Punch account record.
- C Execution account record (this includes the information from the job accounting interface).
- C RJE Session Account Record.

These records are written to the Account file as events occur. When the account file reaches a certain limit (e.g. 80% full) or at predetermined intervals (e.g. daily) it should be cleared. This can be done by an operator command and the contents can be copied to a sequential disk file, tape, punched onto the punch queue or deleted. There is no need to stop processing when the account file is cleared and VSE/POWER will suspend a task that needs to write to the account file until the clear/copy command is finished. The copied records can be processed to obtain statistical information about the running of your system.

This information may be used to charge back user departments for processing their jobs as well as guide the DP department management as to what is going on the system.

3 Reader Exit

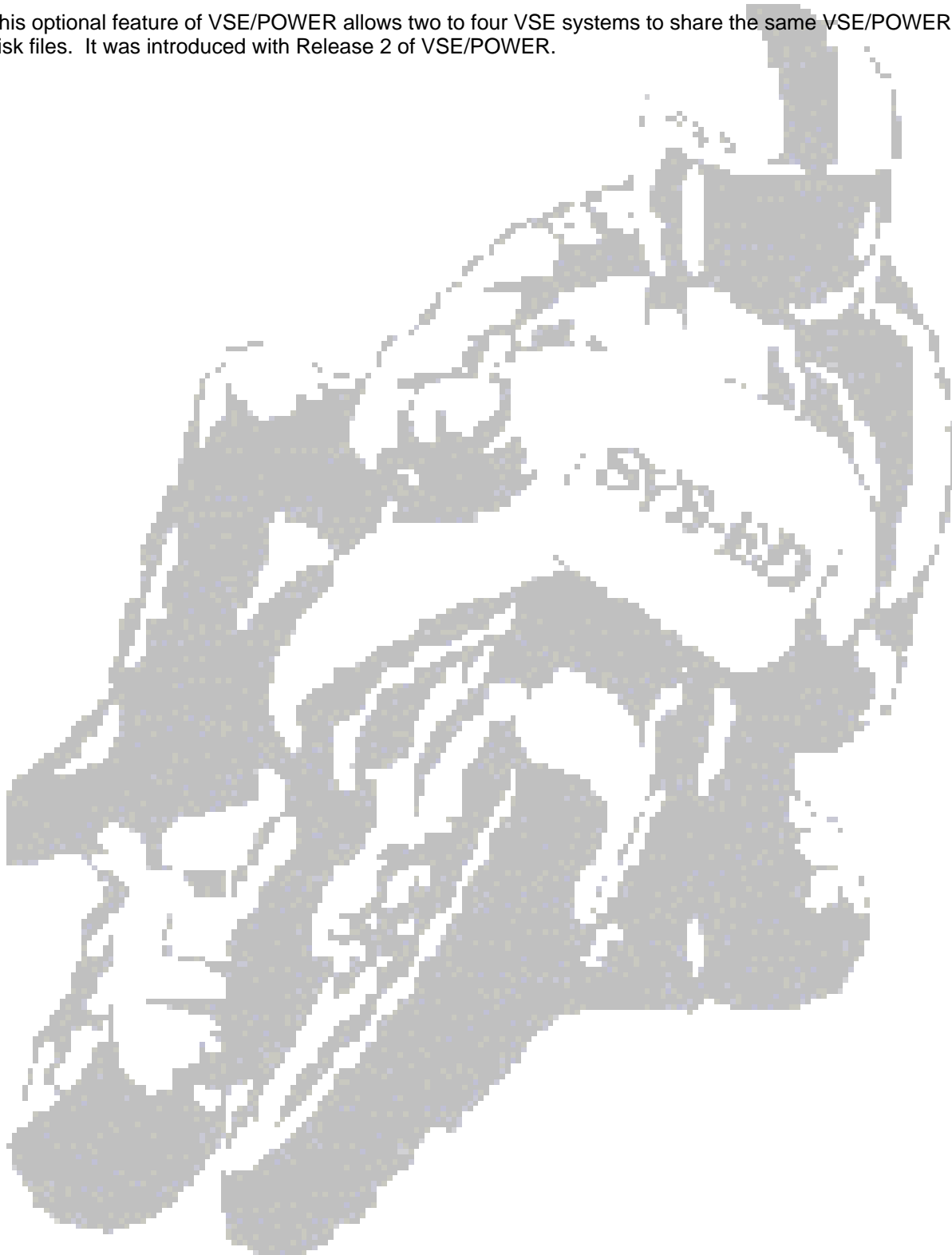
This is a user written program which can run with VSE/POWER in its partition. It receives control from VSE/POWER for every DOS/VSE JCL statement and VSE/POWER JECL statement.

Prior to returning control to VSE/POWER it sets a return code and VSE/POWER carries out one of the following actions:

- C Process the statement normally.
- C Insert a new statement and return original statement to reader exit.
- C Delete statement.
- C Flush DOS/VSE job.
- C Flush VSE/POWER job.

4 Shared Spool Facility

This optional feature of VSE/POWER allows two to four VSE systems to share the same VSE/POWER disk files. It was introduced with Release 2 of VSE/POWER.



5 Commands

There are three groups of commands to aid operators running a VSE/POWER system. Each command starts with a 'P' and has an abbreviated one character format (except PEND).

5.1. Queue Management Commands

Queue Management commands control the input and output queues.

PDISPLAY	D	Display status of job(s)
PALTER	A	Change attributes of jobs(s) or partitions.
PDELETE	L	Delete job(s).
PHOLD	H	Place job(s) in hold/leave disposition.
PRELEASE	R	Release job(s) for further processing.
POFFLOAD	O	Save/restore entries on a queue.

5.2. Task Management Commands

Task Management Commands are for controlling reader, printer and punch tasks, executing jobs and partitions.

PSTART	S	Start Task or partition.
PSTOP	P	Stop task or release partition from VSE/POWER control.
PGO	G	Reactivate task or partition after message to operator.
PEND	-	Terminate VSE/POWER.
PCANCEL	C	Cancel PDISPLAY command output.
PFLUSH	F	Cancel partition or terminate task.
PRESTART	T	Restart a printer or punch task.

5.3. Control Commands

Control commands are for special action

PBRDCST	B	Transmit message (RJE).
PACCOUNT	J	Clear/copy job accounting file.
PINQUIRE	I	Give RJE line(s) Status.
PSETUP	U	Print dummy pages to aid printer setup.
PXMIT	X	Route commands to another VSE/POWER system.