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Operating Guide

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Abstract:

This manual gives a complete description of the operator interface in the operating system BOSS: starting up, closing down, handling of peripheral devices, operator commands to BOSS, operator messages and requests from BOSS, handling of problem situations.

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FOREWORD

First edition: RCSL No 31-D123, March 1972.

Second edition: RCSL No 31-D230, December 1972.
This edition corresponds to release 2 (November 1972).
The more important changes are the following: The operator may send messages to the online users by means of the message command. He may force a logout of the users by means of the remove command. He can get a list of the current online users by means of 'display login'.

The text sent as a message to the users is a line specified by line number in the operator's current job file. The operator may select a standard file containing common messages as his job file, and can in this way simplify the message sending. He may also edit the job file and save the modified version.

Third edition: RCSL No 31-D312.
This edition corresponds to release 10 (July 1975).
The more important changes are the following: An operator display giving automatic surveys of the system state can be connected.

The operator can stop job enrolls by means of the stop command.

The operator can enroll an internal job from the backing store by means of the newjob command.

The operator can control the choice of paper forms for the printers by means of the select/reject commands.

After break down of BOSS, the operator can save the files which were ready for printing but not printed by means of the 'saveconv' program.

A facility for getting part of the printer output on magnetic tape which was introduced in the second edition will not be implemented as described and the description has therefore been removed.

It is possible to connect minicomputers as remote batch stations and BOSS can handle remote devices such as terminals, lineprinters, card readers and tape readers. A description of these remote devices both from the user's and from the operator's point of view is included.

Rune Einersen
A/S REGNECENTRALEN, August 1975

Fourth edition: RCSL No 31-D461, October 1977.
This edition corresponds to release 13 (July 1977).

Fifth edition: RCSL No 31-D498.
This edition corresponds to release 14 (november 1977).
The more important changes are the following: The operator may define a text line (hot news) to be written on each terminal at login.

The operator may take a copy (snapshot) of the actual contents of the file bosstest. This copy may be saved or analyzed by the program 'last' as usual.

The operator may like other users display the contents of the convert queues.

A new terminal state has been introduced (the autoline state). In this state BOSS generates line identifications for sequential line insertion.

Furthermore, at start up warnings concerning overdrafts are dis-

played, the saving of print files at break down has been changed and a 'call' command has been added.

Lars Otto Kjær Nielsen, Bent Bæk Jensen
A/S REGNECENTRALEN, April 1978

Sixth edition: RCSL No 31-D680.
This edition corresponds to release 18 (August 1982).
Descriptions of commands available to normal users are removed, as they are found in the user's guide. The following device handling descriptions are added: diskette, cassette tape.

The following commands have been added: route, cancel routing.

Most of the chapters are revised according to system updates. Error handling instruction, complete list of commands and device status interpretation are added.

Carl Henrik Dreyer
A/S REGNECENTRALEN af 1979, October 1982

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1. INTRODUCTION 1.

This manual describes the operator interface of BOSS. The operator is the person having the job of carrying out the manual operations needed in the computer room: start up of the system, mounting magnetic tapes, changing paper in printer etc. Besides this, the operator has special rights to control the system. These main tasks are described in this manual.

Finally, the operator is also offered the normal user interface. This is described in ref. [1].

The special task of adapting BOSS on a specific installation (including usercatalog and accounting system) is described in ref. [2].

Chapter 2 describes the start up and close down procedures.

Chapter 3 introduces the basic elements of the operator interface, including a definition of who is actually accepted by BOSS as operator.

Chapter 4 describes all operator commands including the proper syntax.

Chapters 5 to 11 give details on the handling of different devices.

Chapter 12 describes the operator actions related to the account system.

Chapter 13 lists some possible problematic situations (including system errors), and give suggestions on what to do.

Appendix B lists all operator messages from BOSS, and an explanation of the situation.

Appendix C gives the interpretation of a device status, delivered when some troubles with a device occurs. The interpretation will give at least some hint on what the trouble is.

Readers not familiar with BOSS are suggested to consult ref. [1] to get some knowledge of the user interface.

BOSS is designed to have as little operator interaction as possible, and when the operator is needed, he is notified explicitly by a "request". Whenever possible, BOSS automatically is notified when the operator action has taken place. A typical example is magnetic tape stations: the operator just mounts a tape on some tape station, and BOSS takes care of the rest.

In the examples throughout this book, the following signature is used, to clarify the dialogue:

*	asterisk means: the attention key is pushed (ESC)
->	this signature indicates that the following text is typed in by the operator. It is always ended by "new line" (pushing the RETURN key), which does not explicitly appear in the text.

Common conventions in syntax descriptions, etc.:

<devno>	is a device number (in the monitor).
<rem.pr>	is a name of a remote printer. It must be the name of a catalog entry describing the printer. This entry must be visible from the standard base of the operator, and protected against modification by the operator, which means that the base of the entry must be greater than the project base of the operator (the entry is "visible and protected"). Details are found in ref. [1].
<projno>	is a project number.
<username>	is the user name, as used in login, etc., e.g. "jma".

<jobname> is a user name followed by a user index, used as the name of the job process, e.g. "jma0".

2. START UP, CLOSE DOWN 2.

When BOSS is started up, the backing storage must contain the 10 translated load modules which constitute BOSS. The user catalog and a job file for the account job must be present on backing store too. Monitor and utility system also must be present.

The start up now consists of loading the load module file 'bos'. This may be done in three different ways as explained below. Bos loads the other load modules, initializes the system and creates the necessary run time files. Finally, temporary files and login files are cancelled automatically (as far as possible) and the user catalog is updated according to the actual contents of the main catalog. Now BOSS is ready for use. The first time the operator activates BOSS, he will be asked to log in. The entire start up takes about 1/2 minute.

Quite a few things are checked during start up, and BOSS may give up and refuse to proceed. In most cases, this is due to wrong installation options, and ref. [2] should be consulted. The situation is clearly distinguished, as the error messages end up with

```
***bossfault 5
```

If the load modules are permanent, they will normally exist on backing store after close down, and then it is easy to start up again.

If the load modules are temporary or login, they will be cancelled during start up, and thus you must reload them before you can start up again.

Notice that you may win some backing storage resources if you let the load modules be temporary and collect them all in one (permanent) file (e.g. by means of the utility program 'binout') and then load them before each start up ('binin').

2.1 Test Output

For the sake of error reporting and internal statistics, BOSS should be started with a file for test output. In case of break-down, the test output contains essential information on the events leading to the break-down.

The test output is produced in a backing storage file or on a magnetic tape file. In both cases the name of the file is 'bosstest'. If no testoutput file is present, BOSS will issue the following warning on the main console at start up:

***test output inactive

2.1.1 Test Output on Backing Storage

Backing storage is the preferred medium for test output because backing storage files are easy to handle, and because tape stations are usually a scarce resource.

Create a permanent file on the system base with the name 'bosstest'. The file may have any size, but a reasonable size is about 200 segments.

The file will be used cyclically by BOSS, so a record of the most recent events will be kept (200 segments will typically contain a few minutes).

In case of strange behavior which is not so harmful as to cause a real break-down, you may take a copy of the current contents of the test output file by means of the operator command 'snapshot' (see chapter 4). Notice: this is not possible if test output is on magnetic tape.

2.1.2 Test Output on Magnetic Tape

If a tape station can been spared for the purpose (this station

cannot be available to jobs), the operator mounts a tape and calls the station 'bosstest' before the start up. During start up, BOSS acknowledges this by the message 'test output on file <n>', as test output is generated from the beginning of the file on which the tape is positioned. Thus, it is possible to record several BOSS runs on the same tape if the tape is positioned correctly. Note that a close down leaves the tape in the correct state for the next start up.

When end-of-tape is met, BOSS may either switch off the test output or ask for a new tape on the same station. The choice depends on an option at system generation time.

2.2 Start Up under s 2.2

If BOSS is to use all resources left at present, the start up takes place like this:

```
*  att s                          [Creation
-> all boss run                   [and
   ready
   to boss                        [start of
-> bos                            [BOSS.
```

If BOSS must not use all resources, you may either create a suitable number of other processes first (easy), or you may explicitly state BOSS' resources by further s-commands (not so easy).

The two commands above may be replaced by a single s command:

```
*  att s
-> all boss prog bos run
   ready
```

Now 'bos' will make certain initializations and load the other 9 load modules which will in their turn make other initializations, notably the rewinding of tapes and the removal of any temp and login files on backing storage.

During initialization, certain messages concerning the test output and the use of backing storage resources may appear (see 2.1, 2.1.2 and 2.5).

After the initialization, a message like this appears on the operator console:

```
11.45 boss release 18.00 ready
```

The operator is now expected to log in, e.g. like this:

```
*   att -> boss                    ; login-attention, see below
    type user name and project number
->  pi 314159
```

The login-attention may be issued at any time during start up (even before you type 'bos'). This will suppress some of the start up messages (see 2.5). When initialization is then over, BOSS will continue the login procedure: "type user name ...".

2.3 Start Up as s-Replacement 2.3

Assume that BOSS for a longer period is to be the only operating system in the computer. The start up may then take place as follows:

```
*  att s                    [ BOSS takes over the process
-> replace bos              [ used by "s" and changes its
   ready                    [ name to "boss".
```

After this, start up proceeds as described in 2.2.

At the time of start up, processes created by s may exist in the high address end of the core store. They are left unchanged by BOSS, which will then become their "parent". But parent messages received from such processes will be rejected by BOSS.

The advantage with this start up method is that BOSS may use that part of primary storage where 's' resided (you win at least 6000 halfwords). The disadvantages are that you have to autoload the system if 's' is later needed, and that you cannot have parallel jobs which depend on parent messages.

2.4 Start Up of Experimental Version 2.4

An experimental version of BOSS should be started up in such a way that you can quickly return to the normal version. That is accomplished by having a local set of load modules, e.g. with the entry base (0,0). Start up then takes place under s, like this:

```
*  att s
-> all boss run
   to boss
-> base abs 0 0          [ select the coroutine files
-> bos                   | visible from base (0,0).  ]
```

After this, start up proceeds as described in 2.2.

You could also pack different BOSS versions in different files as mentioned in the introduction to chapter 2.

2.5 Start Up Warnings 2.5

During start up, the main catalog is scanned, to update the user catalog with the actual amount of backing storage used in every single project. The atribution of a catalog entry to a project (or user, if a user has private backing storage claims) is done by finding the project (user) with the tightest project interval that still surrounds (or equals) the entry base.

If a project has exceeded its backing storage claims, a warning message will be displayed on the console. The message has the

form (where the <neg.integer> gives the amount of overbooking):

project no: <project> rest claim: <neg.integer> { slices / entries } on <devicename>

The message may occur in different situations:

1) if files have been created under 's'
2) if the allowed claims in the user catalog have been reduced
3) if overlapping intervals exist in the user catalog

The list is terminated by a message stating the total sum of all overdrafts, if any:

overdraft: <integer> slices, <integer> entries

The detailed warning messages concerning overdrafts may be suppressed by pushing the attention key after the 'bos' command (cf. 2.2), or during the printing of the messages. The message: "overdraft: ..." will still be printed (if there are any overdrafts).

2.6 Close Down 2.6

When BOSS is closed, the activities in progress (editing, job execution, printing etc.) cannot be resumed at a later start up. Therefore you should make certain that all current activities are finished before you close down BOSS.

The operator display (see 3.3) shows all current activities at a glance. If you have not got an operator display, you must use the commands 'request', 'display', display login' and 'display convert' instead. You may use the command 'stop yes' to prevent users of terminals from starting new jobs and printings, and the commands 'hotnews' and 'message' to inform them of your intention to close the system. Finally you may use the command 'kill' to terminate jobs and printings, and the command 'remove' to force logout from terminals.

When all activities are terminated (or if you do not care), you type the command:

```
close
```

BOSS responds with a message like this example:

```
Rivendell Computers 1982.07.22 14.47
boss release 18.00
***closed by operator
```

The first two lines appear on the terminal where the command is issued. The last line unconditionally appears (only) on the main console.

After this, BOSS enters the state 'running after error', i.e. an entirely inactive state.

The situation after close down is described in section 2.7, but briefly:

- active jobs will not stop before they reach a point where they try to communicate with BOSS (you may see tape stations move or notice disc activity)

- terminals, backing storage areas and all other kinds of resources reserved by BOSS or remaining jobs are not released (with the exception of the main console)

Therefore you should now normally remove BOSS:

```
*  att -> s
-> proc boss remove
```

Of course this is not possible if BOSS was started as s-replacement. In this case you have to autoload the system instead.

2.7 Situation after Close Down 2.7

The following rules are valid whether BOSS was closed manually, after a break down (software error), or after a machine malfunction.

All temporary and login files are (in principle) lost, as they will be cancelled at start up. Printing, job execution, on-line conversation etc. is not resumed at the next start up. Print files which are produced but not yet printed at the time of the close down may be printed by means of the 'saveconv' program before the next start up is attempted.

All permanent files are intact, but the state of permanent files being updated at the moment is more or less undefined.

The account file is intact and will be handled correctly at start up.

After an abnormal close down, the testoutput should be saved for later analysis. A magnetic tape used for test output must be saved. A backing store file used for test output must be renamed or copied to magnetic tape (e.g. in an ordinary process under s) before the next start up is attempted.

3. BASIC ELEMENTS OF THE OPERATOR INTERFACE 3.

The operator types commands to BOSS on the main console by pushing the attention key (ESC) (and now the console writes "att"), typing "boss" and "new line" (push the RETURN key), and when the "beep" sounds, types in the command, followed by new line.

Example:

```
*  att -> boss
-> start 5
```

This is the basic procedure. The following modifications exist:

- If the previous interaction on the console was with BOSS, the name "boss" may be avoided, thus:

  ```
  *  att ->              (only push RETURN)
  -> start 5
  ```

- The name "boss" is the process name of the BOSS. Actually you may name the process something else, in which case this name must replace "boss". In all of this manual, the name "boss" is supposed.

- By a command ("att no"), you may reserve the console for exclusive use by BOSS, and then the command typing is further simplified:

  After the ESC key is pushed, BOSS writes ">> <NL>", the "beep" sounds and the command can be typed:

  ```
  *  >>
  -> start 5
  ```

Please note that the use of "att no" on the main console will prevent other processes from communicating with the console, whereby the other systems may "hang".

The operator gets messages from BOSS on the main console automatically, when needed. Usually the line starts with time, stated as <hour> <minute>. A message is only printed once. It may be delayed if the console is occupied with taking input, or reserved by another process. Two types of messages are found:

- Requests, which request some operator action. Once a request is printed, it will be pending until the action requested is carried out. Pending requests are displayed on the operator display, and may be listed by the command "request".

- Informative messages. They do not require an operator action, and "disappear" after having been printed.

3.1 Main Console

The main console is a pre-defined device on a specific system. Normally, this is where the system is started from. In order to keep a nice log of the operator interaction, the console should include a hard copy.

In connection with remote devices (see 3.4) a remote console may be used. But this should be clearly distinguished from the main console.

BOSS prints all messages to operator on the main console. Even if a remote console is used, the same message appears on the main console.

After start up, the first attention received from main console is handled as a login request (just as on user terminals). The main console may be used for typing operator commands, and may at the same time be used as a normal user terminal.

Please note that if BOSS is expecting a command to be typed on the main console (after the "beep" has sounded), all messages from BOSS will be queued until the command is given (the command may be just RETURN).

In order to keep the log on the main console consistent and complete, a new request message is queued up until it has been printed on the main console. While queued, it will not even appear on the operator display.

3.2 Operator 3.2

The question "who is the operator?" will be discussed here.

The main rule is that an operator is a user equipped with operator rights, expressed as privilege (The information is stated in the user catalog):

privilege 1: gives all operator rights, so any command may be given

privilege 2: "half operator", has a limited right to give some operator commands. Used to facilitate operator control of remote devices, which the "main" operator cannot reach (cf. section 3.5).

For details about privilege, see ref. [1].

The above rule implicates that many operators may be logged in simultaneously, from any terminal connected. Please note that operator commands typed on a terminal (VDU) do not appear in the main console log.

The secondary rule says that the user who logs in on the main console is given all operator rights, regardless of the privilege stated in the user catalog.

From these rules it appears that no one has to login on the main console. All operator commands may be given from a terminal. But BOSS needs the main console to print messages to the operator.

3.3 Operator Display 3.3

The system may be equipped with an operator display. This is a pre-defined device on a specific system, usually a VDU, connected in the same way as the terminals.

On the operator display, BOSS will at regular intervals display information on the state of the system, by writing the output from the following commands:

```
(head-line: installation name, time)
request
display
display idle
display convert
resource free
```

If any request lines are written, a "bell" is also output.

3.4 Remote Devices 3.4

In RC8000, all devices (except discs) are connected by establishing a link to the device (as seen from the point of view of the software, so all the hardware and cable connections are assumed working).

Most devices are linked automatically at autoload, and the links will be more or less "invisible".

Some devices are not linked all the time, but a link is established when it is needed, i.e. when the device is to be used. Such a device is in BOSS called a remote device (and the link a remote link).

A remote device may be placed as far away as "visible" from the RC8000 running BOSS. It may be connected via RC-NET, common front end, a concentrator network or it may even be placed on the local (maybe only one) front end. So, despite the term "remote", the

device may be placed anywhere, even in the computer room of RC8000.

The facilities offered on remote devices serve several purposes:

- On a concentrator situated far away (maybe another town), the terminal users working here prefer to use their "own" devices (on same concentrator). This is supported by BOSS for devices of type printer, paper tape reader, card reader. And this is where the "half operator" comes in.

- In many cases a device should be shared among several RC8000's, using it one at a time.

- In some cases the remote device facility gives an extra possibility, because it is explicitly selected by name. As to printers, this facility is an alternative to the advanced administration of standard printers offered by BOSS.

A remote device is usually selected by a name. This is the name of a catalog entry, describing device kind, where it is placed etc. See details in ref. [1]. For example, this name appears in "display convert" instead of device number (after "convert" on a remote printer). The catalog entry is protected against chnage of normal users.

Sometimes, however, a remote printer is selected implicitly. If the terminal is "remote", printer output is as a default printed on the printer "just besides" the terminal. The printer is said to be "remote by default". This facility is of course introduced to service users working on a distant concentrator (in "display convert", the concentrator ident appears instead of printer device number).

BOSS' support for remote devices sometimes involves that an operator message (maybe a request) is sent to the remote console, to advice a remote operator. Such a message may also appear on the main console. This should not confuse the operator, except if the remote device is connected to the same device controller as the main console: then the message appears twice.

3.5 Remote Operator 3.5

The previous sections outline the environment and need for a remote operator. Here some details are added, referring to later sections, which should be read first. A complete description of conventions for remote devices (including user commands) is found in ref. [1].

The remote operator is equipped with:

- a remote console, where operator messages and requests appear (note that requests will be pending as usual, so they are not distinguished from normal requests)

- a terminal, connected as a remote device (remote link), which may be the remote console

- privilege 2

The devices handled, are the ones connected via the same device host as the remote operator's terminal, and should be connected as remote devices.

Among the operator commands, the remote operator can use the following:

answer
test
snapshot
start card (start the remote card reader)
job (loading jobs from remote paper tape reader)
regret (on remote paper tape reader)
repeat <rem.pr.> { all / <number of pages> } { 1 / 0 }
kill <rem.pr.>
route <rem.pr.> to { std / <rem.pr.1> }
cancel routing <rem.pr.>

In the printer commands above, the <rem.pr.> must specify a remote printer on same device host as the remote operator, but the protection (of the catalog entry) from change, elsewhere enforced on remote printers, is released here. So the catalog entry only has to be visible from standard base.

4. OPERATOR COMMANDS, ALPHABETICALLY 4.

Below follows a list of the operator's commands i.e. all commands accepted from users having privilege 1 or 2. Only the first four letters of the command name are actually used by BOSS. To ease the overview, the command name is underlined, but the underlining is no part of the command.

answer <jobname> { { <text> }$_0^1$ <integer> }$_0^1$

The operator's answer to a pause message from a job. The operator may return an integer and/or a text (a small letter followed by at most 10 small letters and digits).

A job which has requested to be stopped for a period may also be restarted by this command (see ref. [6], parent message wait).

call <devno> <device name>

This command will cause BOSS to perform the monitor function 54: 'create peripheral process' with the parameters specified, i.e. the device with logical device number <devno> is given the name <device name>.

cancel routing { <rem.pr.> / std / all }

The command cancels a previously created routing from the printer mentioned. Std means: from standard printers. All means: all routings. Note that converts already routed are not influenced by this command.

change <devno> <paper>

The device must be a printer which has asked for change of paper. The operator recommends in this way another paper format to be used first.

close

Close down of BOSS (see section 2.6).

even <devno> <tape name> [{ w / p / r } <projno>] 1 / 0

Follows the same conventions as 'label', but writes the label in mode 2, i.e. in NRZ mode with even parity on Ampex stations (RC747 and RC749) and in PE mode with even parity on other stations.

hotnews { <integer> / no } 1 / 0

Using this command the operator may create an urgent message which is then displayed automatically on each terminal logging in, and on all terminals logged in.

The command belongs to privilege class 1 (operator) if parameters are present, otherwise it is unprivileged (class 10).

The 'hotnews' command with an integer parameter causes the line specified by the parameter to be displayed on all terminals logged in at that moment just as the 'message' command with the parameter 'all'. Furthermore a copy of the line is saved and displayed to any user logging in. The contents of the hotnews line may be listed by using the command without parameter.

The 'hotnews' command with the parameter 'no' removes a possible pending hotnews line.

The hotnews line will also be displayed by the request command and on the operator display.

job <n> { tre / trf } 1 / 0

Tells BOSS that <n> more paper tape jobs in the mode specified are to be loaded. The mode is as follows:

nothing = the standard mode of the installation
tre = ISO tapes
trf = flexowriter tapes

The jobs may be regretted again by means of the regret command.

kill <jobname>
Aborts the job specified. The output file from the job is not touched and will be printed later.

kill { <devno> / <rem.pr.> }
The device must be a printer. BOSS skips the remaining part of the file printed currently. In order that the next file is not skipped by a mistake, it is wise to set the printer in the local mode before typing the command. For the same reason BOSS demands that at least some pages of the file have been printed already (installation parameter, may be zero).

kit <devno>
Asks BOSS to clear up on the logical disc (logical backing storage) specified by <devno>, preparing for a change of kit. BOSS reports back either 'kit in use', (then the operator may try again later) or 'change kit' (then the operator may change the kit).

kitlabel <devno> <kit name> <cat. size> <slice size> <disc size>
Works as 'kit' but initializes the new kit with a chain table and an empty catalog. All sizes are specified in segments.

label <devno> <tape name> { { w / p / r } <projno> } { 1 / 0 }
Write a label as file 0 on the tape mounted on the station <devno>. The tape name must be of 8 characters total: the first two must be "mt", the next two may be digits or small letters, the last four must be digits.

The label is written in mode 0, i.e. in NRZ mode with odd parity on Ampex stations (RC747 and RC749) and in PE mode with odd parity on other stations (on some stations, the density must manually be selected to correspond to this). Other modes: see the commands: even, nrz and nrze.

Now the tape is identified and handled as if a new tape was mounted.

If the station already has mounted a tape with proper label, or if no tape is mounted, the message

labelcommand on <devno> <tape name>

appears on the main console, and the operation is delayed until a new tape is mounted.

The access code (w, p, r or <empty>) determines how the tape may be used:

w (work) Any job may borrow the tape for a single run. <projno> may be 0.

p (project) Only jobs with a matching project number may write on the tape. Any other job may read it.

r (reserved) Only jobs with a matching project number may use that tape.

<empty> Any job may use the tape.

message { all / <jobname> } <line no>

Sends the text from the specified line of the job file to the terminal corresponding to <jobname>. If 'all' is specified, the line is sent to all terminals logged in for the moment.

It may happen that a terminal has a pending message already. In this case, 'message all' just skips that terminal, but 'message <jobname>' is rejected with 'wait'.

name <devno> <tape name> [{ w / p / r } <projno>] 1 / 0

Identifies the tape on the station specified, with the effect that BOSS treats the tape as if it had a label with that information. The operation may be delayed as for the label command, but

here the message says:

namecommand on <devno> <tape name>

The tape name must be one small letter followed by a maximum of 10 small letters and digits (as distinct from a proper tape label name).

nrz <devno> <tape name> [{w, p, r}<projno>] {1, 0}

Follows the same conventions as 'label', but writes the label in mode 4, i.e. in NRZ mode with odd parity on most stations.

nrze <devno> <tape name> [{w, p, r}<projno>] {1, 0}

Follows the same conventions as 'label', but writes the label in mode 6, i.e. in NRZ mode with even parity on most stations.

regret <n> {tre, trf} {1, 0}

Tells BOSS that <n> less paper tape jobs in the mode specified are to be loaded. The mode is as follows:

nothing = the standard mode of the installation
tre = ISO tapes
trf = flexowriter tapes

BOSS reports back the number of tape jobs still to be loaded in that mode.

reject <devno> {all, [<paper>]4..1}

The device must be a standard printer.
The specified paper types are excluded from the set of available paper types for the specified printer (see 6.4).

remove {all, <jobname>}

Forces a logout on the terminal corresponding to <jobname>. If 'all' is specified, all terminals are logged out.

repeat { <devno> / <rem.pr.> } { all / <number of pages> } 1 0

The device must be a printer. The last pages are printed again. A standard number of pages is repeated if the number is not specified. If that many pages cannot be repeated from the current file or if 'all' is specified, the maximum number of pages is repeated.

route { std / all / <rem-pr.> } to { std / <rem.pr.> }

Creates a routing, as specified. "Std" means "on a standard printer", "all" means all converts, <rem.pr.> is the name of a remote printer.

The routing changes the selected printer for all future converts, and for all converts currently queued, having the selected printer as the "from-parameter" in route.

The routing may not take place instantly, but is postponed until the moment that it should have been printed.

The maximal number of routings is an installation parameter.

It is checked that the total list of routings does not contain loops.

It is allowed to state the same printer as "from-" and "to-" parameter.

select <devno> { all / [<paper>] 4 1 }

The device must be a standard printer.
The specified paper types are included into the set of available paper types for the specified printer (see 6.4).

snapshot <file name> { <kit name> }1 0

The command has the effect that it creates a backing store area of the same size as 'bosstest' with the specified name on the specified kit, if any (otherwise on the system disc), but with the operator's login scope. Then the testoutput mechanism of BOSS is switched off, the 'bosstest' area is copied to the just created area and the testoutput is switched on again.
By use of this command the operator may save valuable information about a strange behavior of BOSS without closing down.

start <devno>
The device must be a standard printer. Printing on that device is resumed, e.g. after change of paper or hardware malfunctions.

start acco
Starts the account job.

start card { <devno> }1 0

Starts a standard card reader after a hardware malfunction.
<devno> may be omitted if the installation has only one standard card reader.

start card <devname> { std / <printer name> }

Start loading card jobs on remote card reader.

Stop { yes / no }

'Stop yes' forbids further job enrolls from terminals, thereby making it possible to close down properly. 'Stop no' allows further job enrools.

test <first> { <last> }1 0 <pattern>

Selects the testoutput mode for the coroutine <first> or for all coroutines in the interval from <first> to <last>. The coroutines of BOSS are identified by integers as explained in ref. [3].
<pattern> is an integer between 0 and 7 defining the testoutput mode which is initially determined by the options 'e9' and 'e81' to 'e98'. Zero means that no testoutput is produced from the coroutines specified, 7 means all test output.

5. DISC 5.

The system disc kit cannot be changed while BOSS runs, as part of BOSS resides on the kit. This also applies to "drum" and the kits which contain one of the areas "drumcore", "disccore", "usercat" and "bosstest". For other disc drives the operator may ask BOSS to prepare a change of kit by means of this command:

kit <devno>

BOSS answers either 'kit in use' or 'change kit'. In the first case the kit cannot be changed and the operator must attempt the kit command again later (with the present system, a steady stream of jobs may prevent the operator from ever succeeding). In the second case BOSS has performed the clear up necessary so that the operator may go ahead changing the kit. BOSS detects when the new kit is ready so that no more communication is necessary.

It must be emphasized here that the term "kit" is used for a logical backing storage (a logical disc). A physical disc pack is often software-wise split in several logical discs. But the device number stated in the kit command is always referring to a logical disc. In case the disc pack that is to be removed contains several logical discs, a kit command must be stated for each (may be done without awaiting the answer to the previous).

The operator may perform an uninvited change of kit like that above in case certain disc kits must be ready for the users in certain periods of the day.

Some disc drives may be available for reservation by jobs, and in that case the operator may get a message like this:

<job name> kit <kit name> on <devno>

Now the operator orders a change of kit just as above, and when the new kit is read, BOSS will let the job continue.

Note that the so-called "Diablo disc" (RC3652, 2.4 Mb) is handled exactly as an ordinary disc kit.

5.1 Kit Label 5.1

The operator may ask for change of a kit followed by initialization of the new kit mounted. The conventions are as for 'kit' but the command specifies the new kit name, the size of the catalog, the slice length and the size of the entire kit:

kitlab <devno> <kit name> <cat. size> <slice size> <disc size>

All sizes are specified in segments. Note again that the kit specified is a logical disc.

6. MAGNETIC TAPE 6.

The magnetic tape stations may be split into two groups:

- A pool of stations. When some tape is needed, the operator may decide freely which station to mount the tape.

- A number of special stations. When a job needs a tape on such a station, the device number is always specified, and the operator must mount it here. Note that a cassette tape station normally is included in this group (cf. chapter 11).

Magnetic tape stations cannot be handled as remote devices, but as noted in section 6.6, they may be shared anyway.

All magnetic tape stations have a button for switching the station between two states:

- online (or remote): the station is connected to the machine
- offline (or local): the station is not connected, and tapes may be mounted, unmounted, etc.

Many magnetic tape stations also have a button for selecting the density and formatting of the tape mounted. This button is often outside software control, and so it must be set manually to conform with the format of the tape mounted.

Reading tape labels

Any time a tape station is switched to the online state, BOSS is notified, and inspects the tape label (in file0) in order to assign a proper name to the device.

If the label reading succeeds, the tape name is assigned to the device. If the tape is ordered (see section 6.1), BOSS takes care of the rest. If the tape is not ordered by any job, the following request appears:

not wanted on <devno> <tape name>

If the label reading does not succeed, the device cannot get a proper name assigned, and one of the following requests appears:

no label on <devno>
too bad tape on <devno>
name illegal on <devno> <tape name>

Now the operator may proceed as described in sections 6.3 or 6.4.

Warning concerning the use of magnetic tapes
Make sure that only one action at a time is performed concerning a specific tape:

When a job sends a mount message to BOSS for a magnetic tape which is not mounted, then: wait until the request line is displayed on the main console before you use the name or label commands or you set the tape station online.

When BOSS tries to read a label on a tape, then: wait until it has finished the label reading and eventually displayed a request line concerning the tape before you use the name or label command.

6.1 Mounting in the Normal Case 6.1

BOSS orders a tape mount with requests like this:

<jobname> mount tape <tape name> on <device>
or <jobname> mount tape <tape name>
or <jobname> mount tape

In the first case the tape is to be mounted on the special station shown. In the second case the tape is to be mounted on a free standard station. BOSS assures that a free station exists in the following sense: it is either local or the operator has mounted an unwanted tape on the station (as pointed out by BOSS at the moment of mounting).

In the last case the request concerns a scratch tape (see 6.2, and chapter 4: "label"-command, access code 'w').

The operator mounts the tape and sets the station online. On some stations the density must be manually selected in advance. If the tape has a proper label (matching the tape name wanted), BOSS takes care of the rest. In case the operator does not know the tape requested, he may kill the job instead.

The message 'mount tape' may appear with an extension 'mounts exceeded', which shows that the job has asked for more mountings than allowed in the job specification. The operator may choose between mounting the tape or killing the job.

If the operator has already mounted the tape, before it is ordered by BOSS (then it is "not wanted"), the mount request will not appear, as no operator action is needed.

6.2 Scratch Tapes

The tape name in the mount message may be absent, which means that a free scratch tape is wanted. In this case a suitable scratch tape (see chapter 4, the label-command, access code 'w') is mounted and if the label is ok, BOSS takes care of the rest. If the tape chosen is reserved for another job, BOSS answers the tape mounting with the request 'not wanted'.

6.3 Operator Naming of Tapes

In certain situations a tape must be explicitly given a name by the operator:

- the tape has no proper label (a new tape, or a special tape),

- the tape has a proper label (including a proper name), but for some reason it should be used by another name.

This is done by the command:

name <devno> <tape name>

where <tape name> is a small letter followed by a maximum of 10 small letters and digits. The full description of the command is found in chapter 4.

A tape identified by the name command is not changed by BOSS, and even the label reading is avoided.

When receiving a name command, BOSS will use a tape already mounted, only if it has not got a proper name (i.e. the label reading did not succeed).

Otherwise (if a named tape is mounted, or no tape is mounted), the naming is postponed until a new tape is mounted, and the operator message

namecommand on <devno> <tape name>

is displayed. This is to avoid destruction of a wrong tape, as the next tape mounted on the station will unconditionally be identified by the name command, regardless of its label.

In order to avoid confusion and mistakes, use the following "safe-and-sound" procedure:

1) Select a tape station not in use (maybe a specific station is indicated in the mount message).

2) Set the station offline. If the tape wanted is already mounted, let it remain there. Otherwise remove the tape.

3) Give the name command. The command may be repeated if, for example, the name is mis-spelled.

4) BOSS responds with

   namecommand on <devno> <tape name>

5) Mount the tape wanted (if not already mounted), and set the station online. Now BOSS uses the tape name given in the command, without trying to read a label on the tape, and this will complete the naming procedure.

6) If you (before mounting the tape!) regret what you have done, you can "get rid of" the name command by following step 7 and 8 and 9.

7) Ensure that the <tape name> given in the name command is not requested. Or give a new name command with a suitable "strange" name.

8) Mount a dummy tape on the station. Now BOSS replies "not wanted ...".

9) Remove the tape again, and the naming is vanished.

6.4 Operator Labelling of Tapes 6.4

While the name command described above leaves the tape in question unchanged, you may wish to write a new label on the tape (for example a new tape reel). This is done by the command:

   label <devno> <tape name>

where <tape name> must be of 8 characters total: the first two must be "mt", the next two digits or small letters, the last four must be digits. The full description is found in chapter 4.

The effect of the command is that the label (including <tape name>) is written in file 0, re-initializing the tape. Any former information on the tape will be lost.

If <tape name> is not correctly spelled, BOSS replies:

label name on <devno>

When receiving a label command, BOSS will write the label on the tape already mounted, only if it has not got a proper name (i.e. the label reading did not succeed).

Otherwise (if a named tape is mounted, or no tape is mounted), the labelling is postponed until a tape is mounted, and the operator message

labelcommand on <devno> <tape name>

is displayed. This is to avoid destruction of a wrong tape, as the next tape mounted on the station will unconditionally receive the label stated in the command, regardless of its contents.

In order to avoid confusion and mistakes, use the "safe-and-sound" procedure in section 6.3 (replacing name command by label command).

6.5 Write-Enable Ring 6.5

When a job attempts to write on a tape without a ring, the following message appears:

<jobname> mount ring <tape name>

The job continues as soon as the ring is on and the tape is mounted again.

In some cases BOSS prevents a job from using a tape with a ring mounted. Mounting with a ring will then cause this message:

<jobname> remove ring <tape name>

The job is swopped out until the ring is removed or until the operator reidentifies the tape (with 'name' or 'label') so that the project numbers match.

The messages 'mount ring' and 'remove ring' may appear with an extension 'mounts exceeded', which shows that the job has asked for too many mountings. The operator may choose to obey the message or kill the job.

6.6 Sharing Magnetic Tape Stations with other Systems 6.6

BOSS handles a (predefined) set of tape stations. This set is used for scheduling jobs, and BOSS attempts to utilize all the stations, leaving the final decisions to the operator, as he is the one mounting the tapes.

The tape stations may also be used by other systems (processes running in parallel with BOSS), in fact BOSS is very cooperative in this concern. The operator may let BOSS read label, name a tape or label a tape, and afterwards let another system use the tape station. Meanwhile, the tape will be "not wanted".

In this situation, the request

trouble on <devno> device reserved by other process

may occur. It is merely an information for the operator, and is withdrawn when the station is set online again.

The tape stations may also be used by other jobhosts (e.g. another RC8000), and then the link is removed (and established to the other jobhost). This situation may not be recognized by BOSS, except if a job explicitly reserves the device, or a job needs a number of stations, and not enough are left.

Normally, the station is ignored until BOSS again recognizes the station (the link is restablished and BOSS is included as user of

the station), but in some cases, the request

trouble on <devno> boss not user of device

will occur. It will be withdrawn when the station again is linked and set online.

7. PRINTER 7.

BOSS supports two kinds of printers, thereby offering two kinds of facilities:

- Standard printers (section 7.1)
  BOSS offers load sharing if several printers are used, and administers printing of many paper types, to minimize change of paper.

- Remote printers (section 7.2)
  BOSS offers automatic start of printing and restart after paper out, malfunction etc.; the printer is explicitly pointed out by name, but paper types are neglected (cf. section 3.4 about "remote".

The routing facility (section 7.3) as well as the facility for saving of print files (section 7.4) covers both kinds of printers.

7.1 Standard Printer 7.1

A standard printer is normally placed near the main operator, and he is supposed to control it (though this is not a demand).

BOSS is prepared to serve several standard printers. As a consequence, all messages and commands concerning standard printers contain the device number of the printer in question.

Standard printers may be shared by BOSS and other systems running processes parallel with BOSS. When a standard printer is needed, the device is reserved, and when the printing is finished, the device is released leaving it available for other processes. If the reservation fails, it is treated as a malfunction.

7.1.1 Standard Printer: Change of Paper 7.1.1

When a job asks for printing of a file the request is queued up inside BOSS and may be granted a long time after the job termination. This enables BOSS to choose among the paper types in a way that paper changes are minimized.

When BOSS detects end of paper in a printer or when no more files are to be printed on the current paper type, the following message appears:

printer <devno> change to <paper number> = <name>

If the paper end was the cause, the remainder of the interrupted file will be printed next time the right paper type is in a printer. The resumed printing will be headed by an explanation

continuation after { endpaper / malfunction }

and will start with a reasonable repetition of the last pages.

When the operator has changed to the paper type ordered, he types this command:

start <devno>

If he wants to use another paper type first he may try to persuade BOSS by means of this command:

change <devno> <paper number>

Then BOSS asks for this paper if some file is to be printed on it. Selection of paper is discussed further in subsection 7.1.4.

It may happen that the operator is asked to mount an unknown paper type. He should then start the printer with some other paper mounted and possibly kill the printing of the strange file (see 7.1.3).

7.1.2 Standard Printer: Printer Malfunctions

In case the printer is switched off, or some other malfunction is detected, BOSS reports

printer <devno> disconnected
or printer <devno> hard error, decimal status = <status>

(<status> is surveyed in appendix C).

After repair, printing is resumed by means of the start command.

The operator may order the latest pages of the current file to be reprinted (for instance because of ribbon malfunction) in this way:

repeat <devno>
or repeat <devno> <number of pages>
or repeat <devno> all

In the first case a standard number of pages is repeated. In the second case the number specified (or as much as possible) is repeated. In the third case as much as possible is repeated. The printer should be in the local state when the command is given.

The current printing will be terminated with the text

*** operator repeat {all / <n>}

The repeat command is also useful after change of paper when the paper form is to be positioned precisely.

7.1.3 Standard Printer: Kill of Printing

The operator may skip the remainder of the file being printed for the moment in this way:

kill <devno>

In order that the next file is not skipped by a mistake, the printer should be local. For the same reason BOSS demands that at least some pages (installation dependent) of the file have been printed already.

The current printing will be terminated with the text

*** output killed ***

7.1.4 Standard Printer: Selection of Paper Types 7.1.4

The commands

select <devno> { all | <paper number> 4 1 }

and

reject <devno> { all | <paper number> 4 1 }

enable the operator to guide the printers choice of paper forms in the following way:

Each printer is supplied with an associated set of 'available paper types', among which the printer may choose freely. This set of available paper types can be initialized or gradually changed by the commands.

select with the parameter 'all':
The set of available paper types for the specified printer is initialized to include all possible paper types.

reject with the parameter 'all':
The set of available paper types for the specified printer is emptied.

select with paper parameters:
The specified paper types are included into the set of available paper types for the specified printer.

reject with paper parameters:
The specified paper types are excluded from the set of available paper types for the specified printer.

Examples:
If the printer number 5 is not allowed to print at all then type

```
reject 5 all
```

and the printer will stop the next time it is going to choose a new file for printing.

If the printer number 5 is only allowed to use the paper type number 0 then type:

```
reject 5 all
select 5 0
```

If the printer number 5 shall print exclusively on paper type number 2 and printer number 25 is going to serve all the other paper types except number 2 then type:

```
reject 5 all
select 5 2
select 25 all
reject 25 2
```

At BOSS start up the set of available paper types is initialized to an installation dependent set of paper types for each printer. Files which are going to be printed on paper types not available for any printer are queued up until the paper type is made available for some printer. It is thus advisable before close down of BOSS to make sure that all files are printed, by using the display convert command.

The change command has effect only for paper types which belong to the set of available paper types.

Special attention should be paid to the paper types with numbers above a certain installation dependent number, since these paper types are treated as a single paper type. Thus either all of these paper types are included into the set of available paper types or all of them are excluded from the set of available paper

types, i.e. if one of them is selected, then all of them are selected and analogous for 'reject'.

7.2 Remote Printer 7.2

This section appends to the description of remote devices in section 3.4.

The remote printer does not require any operator actions to get started, and the paper mounted in the printer is assumed to be of correct type.

7.2.1 Remote Printer: Change of Paper 7.2.1

When BOSS detects end of paper in a remote printer, the file currently printed is suspended, and queued up again. When the operator has changed paper, BOSS automatically resumes printing. Now the queue of print files may have changed, so another file may be printed first. When the interrupted file is resumed, the printing is headed by

continuation after { end paper / malfunction }

and will start with a reasonable repetition of the last pages.

7.2.2 Remote Printer: Printer Malfunctions 7.2.2

In case the printer is switched off or some other malfunction is detected, BOSS reports with the operator message

printer <devno> disconnected
or printer <devno> hard error, decimal status = <status>
(<status> is surveyed in appendix C).

In case the printer is used by another host, no message appears.

In both cases, BOSS will at regular intervals try to resume printing, but after some time BOSS will give up and print the file on a standard printer, heading the print file by the text:

obs obs this is a rerouted remote convert file

This heading should not be confused with the routing facility of section 7.3.

It should be noted that serial printers often are connected via an asynchronous line (on an "AMX"). In this case, all errors are converted by software to "paper out", and so the above-mentioned re-routing is avoided.

The operator may order the latest pages of the current file to be re-printed (for instance because of ribbon malfunction) in this way:

repeat <rem.pr.>
or repeat <rem.pr.> <number of pages>
or repeat <rem.pr.> all

ordering either a standard number of pages, the specified number of pages, or all the file to be repeated.

The current printing will be terminated with the text:

***operator repeat { <number of pages> / all } ***

7.2.3 Remote Printer: Kill of Printing 7.2.3

The operator may skip the remainder of the file being printed for the moment by the command:

kill <rem.pr.>

In order that the next file is not skipped by a mistake, the printer should be local. For the same reason BOSS demands that at least some pages (installation dependent) of the file have been printed already.

The current printing will be terminated with the text:

*** output killed ***

7.2.4 Using Another Device as a Remote Printer 7.2.4

BOSS is prepared to "print" files on any remote device, offering the same facilities as for printers, with the following exceptions:

- Before starting "printing", the following message appears:

<username> prepare <rem.pr> { <file> / primout / jobcontr } segments: <segm>

- The leading and trailing triangles are completely omitted.

7.3 Routing of Print Files 7.3

When a print file is ordered to be printed (and a convert operation is created), a printer is selected for printing the file: either a specific remote printer is selected, or some standard printer (which one is decided later on, depending on paper types). This original printer selection may be changed by the operator by the route command, affecting all currently queued and all future print files.

If - for some reason - the operator decides that a remote printer should not receive any more print files, and they should instead be printed on a standard printer, he gives the command

route <rem.pr.> to std

If the files should be printed on another remote printer (<rem.pr1>), the command is

route <rem.pr.> to <rem.pr1>

If the standard printers should not be used, the routing is

route std to <rem.pr.>

All future print files may be routed to one remote printer:

route all to <rem.pr.>

- or to standard printers:

route all to std

A routing stating "all" will overrule any other existing routing.

The routings created may contain several "levels", but loops are of course not allowed. So, the following routings are allowed:

route lp14 to lp7
route lp7 to lp20

But the following commands are not:

~~route lp14 to lp7~~
~~route lp7 to lp14~~

} NOT ALLOWED

and BOSS responds

not allowed

A routing is active until it is cancelled. The single print files will be routed at the moment when BOSS would otherwise have initiated the printing. And so the print files queued up when the command is given will also be routed. But the actual routing may be delayed.

Notice that routing from standard printer only affects printings on paper types which are currently selected by at least one standard printer.

When the routing of a print file is executed, the information about the originally selected printer is lost, so it cannot be re- stored.

The command "display convert" will list all currently active routings.

It should be noted that the "display convert" command, when listing print files queued up uses the printer name known to the users and operator. As a remote printer may be known by several names, or even have no name (when it is "remote by default"), the list of print files queued up may be confusing to the operator. This may be avoided by a special route command, routing to the same printer.

Example:

The names "lp10" and "lp20" actually point to the same printer, and only the name "lp10" should appear in "display convert", then the command

```
route lp20 to lp10
```

will suffice. And the command

```
route lp10 to lp10
```

will ensure that the name lp10 is used, even if the printer is used as "remote by default".

A routing is cancelled by

```
cancel routing { <rem.pr.> }
               {           }
               { std       }
```

The parameter refers to the "from"-parameter of the route command.

All routings are cancelled by

```
cancel routing all
```

7.4 Saving of Print Files after Break Down 7.4

Temporary convert files which are submitted for printing but not yet printed at the time of close down or unintended break down can be saved by the program 'saveconv' in a process under s before BOSS is started up again.

As a supplement to 'saveconv' a program 'getconv' exists which reads files saved by 'saveconv' and passes them as convert files to BOSS.

Syntax for 'saveconv':

saveconv $\left\{ \text{<tape name>.<mode>} \right\}_{0}^{1}$

The 'saveconv' program writes on the specified tape in the specified mode. If no parameters are present the tape name 'mtsaveconv' and the mode 'mto' are assumed. The format of the tape is chosen so that it may be used for offline conversion.

The process used for "saveconv" must have a std base that includes base -8388606 to -8388606.

The easiest way to start the process is illustrated by this example:

```
*  att -> s
-> proc boss remove all me run
   ready
   to me
-> saveconv
   from s
   pause me mount mtsaveconv
                        [mount the tape on device 10 and
                        [set the station online
```

```
*  att -> s
-> call 10 mtsaveconv start
   ready
```

The files are sorted according to paper type. Each file saved will be surrounded by triangle pages and occupy one file on the tape. Each new paper type is headed by a small file consisting of a single page of text which indicates the paper form number which follows. File 0 is supposed to contain a tape label. File 1 contains information about the first paper type.

Example:

Assume BOSS has accumulated the following files in the convert queue when it stops:

file	paper No
a	1
b	0
c	1
d	0
e	2
f	1

'Saveconv' will write the following on the magnetic tape:

file No	contents
0	(label)
1	'change paper in printer. New papertype: 0'
2	file b
3	file d
4	'change paper in printer. New papertype: 1'
5	file a
6	file c
7	file f
8	'change paper in printer. New papertype: 2'
9	file e
10	'all files have been printed'

Syntax for the 'getconv' program:

$$\text{getconv} \left\{ \begin{matrix} \text{<tape name>.<mode>} \\ 0 \end{matrix} \right\}^{1} \left\{ \begin{matrix} \text{<file no.>.<no. of files>} \\ 0 \end{matrix} \right\}^{1}$$

The program which should run under BOSS expects to read a tape written with the format produced by 'saveconv'. Files containing a change paper request are interpreted and the paper type is used for the succeeding files. Other files are transferred to a disc area and a convert parent message for each of them is sent to BOSS (therefore remember to order a suitable number of 'cbufs' for the job). The program terminates when an 'end of conversion' file is read. The program reads from the specified tape in the specified mode if these parameters are present, otherwise the tape name 'mtsaveconv' and the mode 'mto' are assumed. If file 'fileno' and 'no of files' are specified, the program starts by reading the file with the file number specified and it stops if the number of files specified has been read. Default values of 'file no.' and 'no. of files' are 1 and 'max'.

Both programs ('saveconv' and 'getconv') writes a list of the names of all the files met on current output.

8. PAPER TAPE READER 8.

BOSS supports reading of paper tapes in three basically different ways:

- The operator asks BOSS to enroll a number of tape jobs, i.e. paper tapes containing job files (section 8.1).

- A job may ask BOSS to load a number of paper tapes (into disc files) before the job starts (section 8.2).

- A job may request loading a number of paper tapes during execution (section 8.3).

It is a general rule that the operator must never insert a paper tape into the reader, until BOSS demands so by a request, stating which tape to insert next.

When requested, the operator inserts the paper tape and pushes RESET. Then the tape will be loaded.

8.1 Paper Tape Jobs 8.1

The operator asks BOSS to load and execute e.g. 14 tape jobs with this command:

```
job 14
```

All the job tapes are assumed to be in the standard mode of the installation (ISO or flexo). A separate batch of tape jobs in another mode is specified like this:

```
    job 7 tre     (7 job tapes in ISO mode)
or  job 7 trf     (8 job tapes in flexo mode)
```

In case that 5 more jobs arrive before all previous are loaded, they may be enrolled with 'job 5' or the like, as BOSS remembers the total number of jobs in each mode.

Note that only the modes "tre" and "trf" are allowed.

BOSS requests the operator to load the job tapes by

load reader $\left\{\begin{matrix}\text{tre}\\\text{trf}\end{matrix}\right\}$ job

In case the installation has more than one standard paper tape reader, the name "reader" may be some other name.

The job command may also be issued by a remote operator, if he has a remote paper tape reader; the same conventions apply. If the remote operator has no remote paper tape reader, the command is rejected with the message

no room for output

The request for loading on a remote reader will also be

load <process name> $\left\{\begin{matrix}\text{tre}\\\text{trf}\end{matrix}\right\}$ job

but the <process name> is usually the text "sub" appended with a serial number (e.g. "sub017"), and often changes from time to time.

If a job tape is requested, and the operator has no more job tapes, they may all be regretted by the command

regret 100 $\left\{\begin{matrix}\text{tre}\\\text{trf}\end{matrix}\right\}$ $\begin{matrix}1\\0\end{matrix}$

8.2 Paper Tapes Loaded before Job Start 8.2

This operation is initiated by the enrolling a job that requests paper tapes to be loaded before job start (the job option load), and so no operator commands are needed.

In case standard reader is wanted by the job, the following request appears:

load reader { tre / trf / tro / trn / trz } <jobname> <tape no> <filename>

As for job tapes, "reader" may be some other name. <tape no> is a count of tapes used by this specific job.

In case a remote reader is wanted by the job, the request is:

load <process name> <reader name> <jobname> <tape no> <file name>

where <processname> is for instance "sub017" and <reader name> is the name of the remote device (cf. section 3.4).

In case the paper tape requested is unknown to the operator, he may choose to abort the job, by the command:

kill <jobname>

Note that some tape must be inserted in the reader, otherwise BOSS cannot actually kill the job.

8.3 Paper Tapes Loaded during Job Execution 8.3

This facility can only make use of the standard paper tape reader(s), and is called job controlled reading.

The operation is initiated by a job during job execution, and no operator commands are needed. The following request appears:

load reader <jobname> <tape no> { exceeded }1 0

As for job tapes, "reader" may be some other name. <tape no> is a count of tapes used by this specific job.

The extension "exceeded" is added when the job asks for more tapes than claimed (in this case only every fifth request states "exceeded").

In case the paper tape requested is unknown to the operator, he may choose to abort the job, by the command:

```
kill <jobname>
```

Note that some tape must be inserted in the reader, otherwise BOSS cannot actually kill the job.

In special situations the above load request may appear, demanding no operator action (and usually the request is withdrawn immediately): when a job has claimed a "general input device" (cf. ref. [1]). This is widely used for block oriented terminals (cf. ref. [7]). For example, the request may be:

```
load gin1 chd0 1
```

8.4 Sequence of Load Requests 8.4

When both ISO and flexo job tapes are enrolled, BOSS loads all ISO jobs before the flexo jobs.

If a job needs several data tapes (cf. section 8.2), all these tapes are loaded together without intervening loads for other jobs. Notice that all jobs (also card jobs and online jobs) may ask for data tapes.

The system can only handle one job loading job controlled tapes (cf. section 8.3) at a time, and other jobs requesting job controlled tapes will be "reserving". Requests for such tapes may disperse over several other jobs, and may even intervene between a job tape and the associated data tapes.

9. CARD READER 9.

When the standard card reader is empty and BOSS is ready for the next card job, this message appears:

card reader ready

When the operator inserts a stack of jobs in the reader and pushes RESET, BOSS starts loading the jobs.

When a remote card reader is operated by the remote operator, the operator must first insert a stack of jobs, and then give the command:

start card <device name> { std / <rem.pr.> } { 1 / 0 }

where <device name> is the remote card reader name (cf. section 3.4), and the last parameter specifies printer selection, like in the "newjob" command.

The operator should put a job separation card at the end of the stack, in order that BOSS can recognize the end of the last job. The job separation card contains:

---job

If the operator forgets this, BOSS will report

card reader attention

when the reader is empty again. Now the operator may insert a job separation card (or a new stack of cards) and push RESET. The message

card reader card jam

shows that a card sticks in the reader, or the like. After repair

the reader is RESET. The message

card reader $\left\{ \text{<devno>} \right\}_{0}^{1}$ disconnected

shows that the reader is switched off. When the reader is ready again BOSS is activated with this command:

start card $\left\{ \text{<devno>} \right\}_{0}^{1}$

The message

card reader data overrun

shows that a card read has been lost. Try to read the card once more and type 'start card' again.

10. DISKETTE 10.

Diskettes are often in other manuals referred to by other names, e.g.:

- flexible discs (or flexdicsc, or just fd)
- floppy discs
- discettes

With this in mind, you will never get confused when studying the documentation. Here, we stick to the word diskette.

When a job is requesting a diskette station, the following request may appear before the job is started:

```
<jobname> clear <devno>
```

where <devno> is the diskette station. This enables the operator to remove a diskette used by a previous job. When this is done, the job is started by

```
answer <jobname>
```

When a job is actually going to use diskette, the following request appears (maybe preceded by the mount message, which is not a request):

```
message <jobname> mount  fd0<volume name>
pause   <jobname> enable fd0<volume name>
```

Now the job is stopped (indicated by "pause"), awaiting operator answer.

First, insert the proper diskette in a diskette station.

Next, give the proper name to the diskette station (which has device number <devno>), by the command

```
call <devno> fd0<volume name>
```

Finally, start the job again by the command

```
answ <jobname>
```

Removal of the diskette is not needed until another diskette is demanded by a job.

11. CASSETTE TAPE 11.

Cassette tape stations are normally handled as special magnetic tape stations, see chapter 6, thus enabling many jobs to share the station. Below, an alternative handling is described.

If the station is placed in a distant location and the station is "private to" (only used by), the people working there, and they have good access to the station, an alternative handling may be more convenient. The station will then be handled as a remote device (alternately a remote printer and a remote paper tape reader).

When writing a file on a cassette tape, it is handled as a remote printer (BOSS omits the triangles), and the operator just has to insert the tape before the "printing" is initiated. The "prepare" message appears when the printing is initiated.

When reading a file from a cassette tape, it is handled as a remote paper tape reader, and the reading is preceded by a load request, as for paper tapes.

12. OTHER DEVICES 12.

The devices described in chapters 5-11 are the most common devices, paid special attention in BOSS. They are usually handled as described. But it must be stressed here that the installations have a widely used freedom to set up their own conventions for device handling.

BOSS merely offers a set of different facilities for device handling, which may even be mixed. For instance, you may in ref. [4] and [5] find the printer facilities used for an IBM remote job entry connection.

The actual operator actions imposed on a device are defined by the installation parameters.

As to the operator, many devices do not need any actions to work. When some action is needed, he will receive a request.

The clear request may appear before the job starts:

<jobname> clear {<devno>}7 1

Now the operator should make sure that the devices mentioned are ready: a plotter may need fresh paper, new pen, a punch may need a new roll of paper tape, additional tape feed etc.

When all devices mentioned are ready, the job is started by the command

answer <jobname>

The pause request may appear after a job has started:

pause <jobname> <text> <name>

The actual contents of <text> and <name> may vary (and is not analyzed by BOSS), the notable being the word "pause", which

indicates that the job has been stopped, awaiting operator answer (the procedure resembles the diskette handling).

The operator should know (by agreement, if not obvious from text) which action should be taken. This will often involve giving a name to a specific device:

```
call <devno> <name>
```

When action is completed, the job is restarted by the command

```
answ <jobname>
```

Both the above-mentioned requests may occur at a specific device, so both actions may be needed.

A quite special variant of the clear request appears if BOSS is not even entitled to use a device. The format is best illustrated by the following example:

```
10 23 jma0 clear 1 37* 34* 35 + *boss not user
```

The job 'jma0' requires the devices 1, 37, 34 and 35. The asterisks after 37 and 34 and the text '*boss not user' mean that BOSS is not user of these devices, probably because they are not linked. It is possible that the devices 34 and 37 are devices which would normally not require operator intervention before use and therefore not cause a 'clear' request. The + indicates that the job has requested more than these 4 devices, but the limited length of the request line does not allow printing of all of them. In such cases the operator will have to check with the user (or know the job) before answering the request.

13. ACCOUNTING 13.

During the run, BOSS collects accounting information on a backing store file. When it is about to run full, BOSS automatically starts up the account job which is expected to empty the file. When BOSS is closed down there is no need to empty the file as it survives and is continued at the next start up. In connection with periodic statistics or invoicing it may be necessary to order accounting as follows:

```
start acco
```

If it for some reason is impossible to empty the account file under BOSS it may be done in a process under s by means of the FP commands:

```
base 0 0
rename accountfl.accountfile
i accountjob
```

It is important to type the date and time correctly after auto-loading the monitor, because BOSS refuses to start up if the last account record does not have a date and time which precedes the current date and time. The following message appears:

```
time inconsistence accountfl
***bossfault 5
```

This is a valuable check on the current date and time, keyed in by the operator at autoload. In such cases, check if system time is correct. If not, re-type the correct date and time (this may involve autoload). Otherwise the system time is OK, but it was not correct the last time BOSS was running. This case is de-

scribed in some detail in ref. [2]. Here, the simplest action is repeated:

```
*  att -> s
-> proc boss remove all boss run
   ready
   to boss
-> base 0 0
-> rename accountfl.accountfile
-> base std
-> bos
```

14. HANDLING OF PROBLEM SITUATIONS 14.

The problem situations may be split into three types:

- The system shows "strange behaviour", but is still active. Check with the examples below. If the operator decides to report the problem, take a snapshot. Remember that a snapshot may cover only the last 2-3 minutes.

- The system "dies", without giving any message. Check if it is only the main console that is "dead" (cf. the examples). If the whole system is "dead", break it:

  ```
  *   att -> s
  ->  proc boss break
  ```

  Note that this operation presupposes that the main console is not reserved by BOSS ("att no" not used), and that BOSS is not started as s-replacement.

  Now a bossfault 1 should occur, and you may proceed as below.

- A BOSS fault occurs. Find the code in the list, it may give a reason. Solve the problem and start up again. If the operator decides to report the problem, print out testoutput as described in section 14.3.

14.1 Examples of Operator Mistakes 14.1

Below is described some well known situations that may give the operator troubles, but are easily solved or avoided.

Example 1:
The main console appears dead - and only the console. Check that power is on, and that the cable connector is properly inserted. If the main console does not work properly, BOSS has no chance of detecting it, and the system may be more or less disabled.

Example 2:

A request - expected from a well known job - does not appear. Check the main console by pushing the RETURN key (New Line). The console might be in "input mode", expecting a command, and in this state it will remain until something is typed in, preventing requests and messages from being printed (and a request does not "appear" until it has been output on the main console).

Example 3:

Magnetic tape stations may not be handled in the proper way (and jobs may be aborted with mysterious reasons), if the warning in section 6.1 is disregarded. Therefore, always let BOSS finish one task before you initiate the next.

Example 4:

Remote printers may be "named" by several catalog entries, pointing to the same printer. Thus, on a "display convert", the same printer may occur with different names. This is confusing only to the operator, not to BOSS.

Example 5:

The first standard printer is usually device number 5 with the name "printer". Despite the fact that the printer is released by BOSS when not used, other processes may have problems with using it, e.g. the PRIMO system. The reason is that BOSS is simulating the device named "printer" by a pseudo-process (to facilitate job-controlled printing from jobs).

These problems may be avoided by giving the first standard printer another name (e.g. "mainlp"), thus:

```
   * att -> s
->call 5 mainlp
```

This should be done before BOSS start up. The catalog entry "lp" on system scope should be changed accordingly (insert "mainlp" instead of "printer").

14.2 BOSS Fault

When BOSS detects a serious internal problem, preventing further operation, a BOSS fault is generated. The problem may be an internal bug, but it may be imposed from "the outside", i.e. other processes running in parallel with BOSS, or hardware problems (usually on backing storage). After a BOSS fault, the situation is the same as after a normal close down. If the problem should be reported, print out testoutput as shown in section 14.3.

The list below shows the "internal reason" for the trouble, and maybe a hint to remove or prevent the problem. The headings show which module has detected the trouble. The hints given are only suggestions (for example any BOSS fault may origin from a programming error, or from errors in the disc hardware).

Abbreviations used:

DISC-HW: check the discs (extract discstat), as the hardware may be bad.

P.E.: programming error.

The term "Disc resource mixup" covers several situations, all characterized by that a BOSS job (or terminal user) "exchanges" discfiles/entries with other processes outside BOSS.

Examples are: a temporary file is created outside BOSS, and attempted scoped permanent under BOSS, or a temporary file created in a BOSS job is removed by a process outside BOSS. The point is that the temporary or login files are manipulated, hereby undermining the resource accounts of BOSS.

The term "main catalog size" covers the problems with "balancing the permanent resources against actual usage", described in ref. [2]. They are avoided by a proper main catalog size.

Central:

1 Program interrupt: after "proc boss break", program errors or hardware errors. Should always be reported

2 Access count < 0: P.E.

3 Hard error, virtual store: DISC-HW
4 No room in core for pages (i116): consult ref. [2]
5 Start up alarm (always preceded by an explanation): consult ref. [2]
6 Message buffer claim exceeded: P.E.
7
8
9

Jobstart:

10 Trouble creating swop area: P.E.
11 Trouble modify internal: P.E.
12 Trouble term bs, all claims transferred to job: main catalog size
13 Trouble term bs, alarm create job: P.E.
14 Trouble remove entry, load alarms: P.E.
15 Trouble set cat base, catproc: P.E.
16 Trouble reserve process, catproc: P.E.
17 Common trouble, catproc, not done: main catalog size
18 Trouble, catproc, selective clear: P.E.
19 Trouble, catproc, claim exceeded: P.E.

Term2:

20 Not output (after normal close by operator)
21 Trouble after term bs, scope etc.: disc resource mixup, main catalog size
22 Trouble after prep access, save: P.E.
23 Hard error termout, next job: P.E.
24 Hard error termout, block size: P.E.
25 Trouble term bs-adjust, logout: P.E.
26 Trouble term bs-adjust, after transmit error: P.E.
27 Trouble remove entry, at create output: P.E.
28 Unknown error code, newjob: P.E.
29

Jobstart:

30 Trouble remove primout: P.E.
31 Trouble remove jobfile, kill: P.E.
32 Trouble include user: P.E.

33

34 Trouble request alarm: P.E.

35 Trouble in catproc: P.E.

36 job creation: error at 'change address base'. PE, or check option e/io

37 —— : error at 'set epa value'. PE, or check option e111

38

39

Job:

40 Hard error primout, psjob I/O: DISC-HW

41 FP not available, break and dump: catalog error, DISC-HW, entry fp removed or reserved

42 Hard error catalog, clean catalog: catalog error, DISC-HW

43 Hard error primout, finis: DISC-HW

44 Trouble after term bs adjust, finis: disc resource mixup, main catalog size

45 Trouble after term bs-adjust, finis: disc resource mixup

46 Trouble after remove or adjust primout: entry removed, DISC-HW

47 Trouble after remove area process, finis: P.E.

48 Illegal internal operation: P.E.

49 Trouble adjust primout, finis: disc resource mixup, catalog error, DISC-HW

Mount:

50 Trouble include/exclude user: intervention from other processes (unlikely), P.E.

51 Illegal state: P.E.

52 Trouble include user, check action: see 50

53 Trouble initialize process, name station: P.E.

54 Request trouble, psjob mount: P.E.

55 Request trouble, remoter: P.E.

56 Illegal station table change: P.E.

57 Illegal station table change: P.E.

58 Device number trouble: installation; tape station on devno 0

59 Illegal station table change: P.E.

Read:

60

61

62

63

64

65 Reader not device 0: start up alarm, consult ref. [2]

66 Card reader error: P.E.

67

68

69

Print:

70 Hard error in reading usercat: DISC-HW

71

72 Primout does not exist or area does not exist: the entry may have been removed by another process, DISC-HW

73

74 Job controlled printing inconsistent: P.E.

75

76

77

78

79

Procs:

80 Hard error, accountfl: the file has been manipulated, DISC-HW

81 Hard error usercat, output bsadjust: DISC-HW

82 Hard error usercat, input bsadjust: DISC-HW

83 Hard error usercat, init from usercat: DISC-HW

84 Hard error catalog, unknown sender: DISC-HW

85 Hard error catalog, unknown sender, DISC-HW

86 Hard error catalog, unknown sender, DISC-HW

87 Too many private kits in usercat (> i30): installation problem, consult ref. [2]

88 Trouble creating accountfl: claims on disc missing, or the name is used already

89 Action from table outside limits, init from usercat: usercat destroyed or has an incorrect format, or translated unsuccessfully

Banker:

90 Trouble priority queue, lock in core fit: P.E.

91 Hard error swopout: DISC-HW, parity error in primary storage

92 Illegal internal operation: P.E.

93 Trouble priority queue, release: P.E,

94 Trouble res queue, simulate release: P.E.

95

96

97 Reserve reader, not found: P.E.

98 Release reader, not found: P.E.

99 Assign resources, no free reader: P.E.

Term1:

100 Login attention during run: P.E.

Term2:

101 Login attention during logout: P.E.

Term1:

102 Trouble general print, integer size: P.E.

103 Trouble general print, buffer limit: P.E.

104 Trouble bsadjust, snapshot: P.E.

Term2:

105 Page troubles, kitchange, P.E.

106 Hard error usercat, kitchange: DISC-HW

Term1:

107 Trouble general print, param out of range: P.E.

108 Trouble general print, text index out of range: P.E.

Term2:

109 Call command, name format error: P.E.

Mount:

110 Station table inconsistence: P.E.

111 Station table inconsistence: P.E.

112 No station in searched state: P.E.

113

114

115

116

117

118

119

Banker:

120

121 Job in core semaphore out of range: P.E.

122

123

124

125

126

127

128

129

14.3 Testoutput Printing and Error Reporting

The testoutput is normally generated in a discfile named "boss-test", as described in section 2.1.

During operation, the current contents may be saved by the command "snapshot".

After close down or BOSS fault, the file is still there, and may be saved or printed out before next start up. Note that a reasonable size of "bosstest" is at least 200 segments, to enable a proper analysis.

The saving of bosstest file may be done in several ways:

- by renaming bosstest and creating another file named bosstest for next start up
- saving bosstest on a magnetic tape (use the "move" or "save" program)
- saving bosstest on a diskette

The easiest action is to print out the file bosstest. After a BOSS fault, it may be done like this:

```
*  att -> s
-> proc boss remove all me run
   ready
   to me
-> o lp
-> last bosstest.bs problem description
-> o c
-> finis
```

The parameters "problem description" should be replaced by some words stating the problem, installation etc.

The program "last" only demands a size of 30000 halfwords, so the "all" process created is not a demand. A detailed description of the program is found in ref. [2].

After a "snapshot" is created (or after renaming and restart of BOSS), the file (e.g. named "bosstest1") may be printed using a BOSS job, like this:

```
job me 4711 size 30000 time 11 0
testprint=set 500 disc
o testprint
last bosstest1.bs problem description
o c
convert testprint
finis
```

Please note that a "snapshot-file" gets login scope, and could easily get mixed up with an old file with user scope (and the same name).

When the testoutput has been printed (maybe just saved), an error report may be filled out. It should include a precise description of the problem, and enclosed should be:

- print out of testoutput
- copy of main console log

A. REFERENCES A.

[1] RCSL No 42-i1265:
BOSS, User's Manual

[2] RCSL No 31-D628:
BOSS, Installation and Maintenance

[3] RCSL No 31-D673:
BOSS, Basic Internal Formats

[4] RCSL No 43-GL11806:
RC8000 as IBM2780 Terminal, Reference Manual

[5] RCSL No 43-GL11805:
RC8000 as IBM2780 Terminal, User's Guide

[6] RCSL No 31-D610:
Parent Messages in RC8000

[7] Software Package SW8702:
IBM3270 Terminal Handler

B. OPERATOR MESSAGES AND REQUESTS FROM BOSS B.

This appendix is an alphabetic list of messages from BOSS to the operator. A few messages begin with a job name which is omitted in the alphabetic ordering.
Note that most of the normal user messages are omitted.

accountjob not ok

The file 'accountjob' is not correct. It can be edited online, and then the account job can be enrolled again by means of 'start acco'.
During start up the message may appear as a warning.

boss not user of device

The call command is given on a device where BOSS is not user.

***boss fault <error code>

BOSS has closed down because of serious hardware or software troubles. The message contains an error code giving a hint to the trouble (see subsection 14.2).

card reader <devno> <device name> attention

The card reader is empty but the last job deck is not complete. Insert a job separation card or a new deck and push RESET.

card reader busy

The card reader (specified in the command) is busy reading cards and not waiting for the 'start' command.

card reader <devno> <device name> card jam

A card sticks in the reader or the like. Repair and push RESET.

card reader <devno> <device name> data overrun

A card reader has been lost. Try to read the card once more and type 'start card' again.

card reader <devno> <device name> disconnected

The card reader is switched off. Switch it on and use the command 'start card'.

card reader <devno> <device name> illegal job file mode

BOSS was not able to read the job file. Presumably caused by a wrong value of option i118. Consult ref. [2].

card reader <devno> <device name> ready

The reader is empty and awaits the next job. Insert a new deck and push RESET.

catalog input trouble

Start up error message. BOSS could not start up because it was unable to read the main catalog. Probably hardware error.

change kit

Normal response to the kit command.

change testoutput tape

Mount a new testoutput tape on the same station and set it remote.

<jobname> clear <list of device numbers>

The job needs the special devices shown. Make them ready and use the command 'answer <jobname>'. If more than 7 devices are needed, a "+" is added.

<jobname> clear <list of device numbers> *boss not user

The job needs some special devices, but BOSS itself is not user. Cf. chapter 12.

***closed by operator

Normal response to the close command.

coroutine area missing

Start up error message. Consult ref. [2].

create accountfl error

Start up error message. The file for account records could not be created. Check the resources on the system disc.

create disc core error

Start up error message. Consult ref. [2].

create drum core error

Start up error message. Consult ref. [2].

deadly embrace: kill one or more jobs

Some jobs have locked themselves being unable to get the resources they want. Should only occur in case the account job cannot run successfully.

device not card reader

The device number specified is not a card reader.

device not printer

The device number specified is not a standard printer.

device not disc

The device number stated in kit or kitlabel command is not a disc.

device reserved

The device is reserved by a job or a process running in parallel with BOSS.

device unknown

The remote device requested does not exist, the description (catalog entry) is incorrect or has wrong scope.

device status <file name> octal status = ...

Status error during transfer to/from backing store or terminal. Meaning of status bits is explained in appendix C.

drum or disc missing

Start up error message. Consult ref. [2].

dummy answer coroutine

Start up error message. Consult ref. [2].

e18 and e44 do not match e20

Start up error message. Consult ref. [2].

entries do not match usercat

Start up error message. BOSS could not start up because more permanent entries are present than specified in the user catalog. Most likely because the latest translation of usercat was unsuccessful. Consult ref. [2].

external outside limits

Start up error message. Consult ref. [2].

finis <job name> at <time>

Normal message showing that a long batch job or a long internal job is enrolled. The estimated finishing time of the job (except for print output) is shown.

hard error kit cat on <devno>

Hard error during input of auxiliary catalog from new kit.

hard error on kit on <devno>

Hard error during input of chaintable from new kit.

i116 too small: w0 = min value

BOSS could not start up because of a wrong i116 option. The last testoutput record shows the minimum value possible for i116.

illegal device number in e18-e19

The device list from e18 to e19 in the options contains a number which is not a legal device number.

illegal identification $\left\{ \text{<user name attempted>} \right\}_{0}^{1}$

Wrong user name or project number when the operator logs in, or in a batch job, or in an internal job. The user name attempted is shown in the last two cases.

illegal name on <device number>

The newly mounted kit has the same name as some other device or system file and cannot be accepted.

illegal printer device no.

BOSS could not start up because the BOSS version does not match the hardware configuration.

input error virt core

Start up error message. Consult ref. [2].

i116 too small: w0=min value

Start up error message. Consult ref. [2].

job creation impossible

Disagreement between monitor and BOSS about the available resources. Should never occur.

kind must be p, w or r

Wrong access code in name or label command.

<job name> kit <kit name> on <devno>

The job asks for a kit on the device specified. Use the command 'kit <device number>' to let BOSS prepare for the kit change.

kit cat base illegal on <devno>

Newly created auxiliary catalog cannot be accessed. Should never occur.

kit cat name form on <devno>

The new kit mounted has an improper chaintable.

kit cat syntax error on <devno>

The new kit mounted has an improper entry in the auxiliary catalog.

kit in use

The kit cannot be changed now. Try again later.

kit mounted and ok on <devno>

Successful kit mounting completed.

labelcommand on <devno> <tape name>

A label command has been accepted, but postponed, cf. subsection 6.4.

label name on <devno>

Tape name in label command does not conform to standard.

load <process name> {tre / trf} job

Insert job tape in the paper tape reader specified by <process name> and push RESET. If <process name> is the text "sub" and a serial number (e.g. "sub017"), a remote reader is meant. As the name may vary from time to time, the remote operator should be prepared for this.

load <process name> {tre / trf / tro / trn / trz} <jobname> <tape no> <file name>

Insert a data tape in the standard paper tape reader specified by <process name> and push RESET.

load <process name> <reader name> <jobname> <tape no> <file name>

In the remote reader, specified by <reader name>, a data tape must be inserted, and RESET pushed.

load <process name> <jobname> <tape no> {exceeded / } {1 / 0}

Insert a data tape in the standard paper tape reader specified by <process name> and push RESET. The text "exceeded" may be added if the job has asked for more tapes than claimed. Note that the request may appear, specifying a special device which is not a paper tape reader. In this case no operator action is needed (the request is withdrawn immediately).

max coroutine too small

Start up error message. Consult ref. [2].

message <jobname> <message contents>

Message from the job to the operator.

<jobname> mount tape [<tape name>] $^{1}_{0}$ [on <devno>] $^{1}_{0}$ [mounts exceeded] $^{1}_{0}$

Mount the magnetic tape shown on a free standard station or on the device specified. A missing tape name means a scratch tape. 'Mounts exceeded' shows that the job has asked for too many mountings.

<jobname> mount ring <tape name> [on <devno>] $^{1}_{0}$ [mounts exceeded] $^{1}_{0}$

Mount a write-enable ring on the tape. 'Mounts exceeded' shows that the job has asked for too many mountings.

mount ring on <devno>

Occurs after a label command. Mount a write-enable ring and BOSS will write the label.

namecommand on <devno> <tape name>

A name command has been accepted, but postponed, cf. subsection 6.3.

name illegal on <devno> <tape name>

The magnetic tape has the same name as some other device or system file, and it cannot be accepted.

no label on <devno>

BOSS could not understand the tape label. Use the name command or the label command.

no room

Too many routings. Also a user message.

no room for output

The remote operator has issued the job command without being equipped with a remote paper tape reader.

no such job

The job specified in the command does not exist.

not allowed

Appears in different cases: The command is not allowed, as the user does not have operator rights. A loop is found in the routings (after route command).

not found

May appear in response to the commands repeat, kill, route, cancel routing. The printer specified is not a standard printer, or the remote printer is not "visible" (maybe the describing entry is not correct). Also a user message.

not same mode

The mode which is implicitly given by the 'start card' command differs from the mode last used. Presumably caused by a wrong value of option i118. Consult ref. [2].

not wanted on <devno> <tape name>

The tape just mounted has not been asked for. Use the name (or label) command or mount another tape.

only one protection key available

Start up warning message. BOSS is started in a process with only two protection keys. One is used by BOSS itself and the remaining one is used by the jobs thereby prohibiting two jobs from being in core simultaneously.

option unknown $\left\{\begin{array}{l}\text{<option name attempted>}\\ \end{array}\right\}\begin{array}{l}1\\0\end{array}$

A batch job or an internal job was not enrolled because it did not start with the keyword 'job'. The <option name> is omitted in connection with newjob.

output error virt core

Start up error message. Consult ref. [2].

param

Missing parameter to a command, integer instead of name etc.

param at job

A batch job or an internal job was not enrolled because of wrong parameter sequence after 'job'.

pause <jobname> <message contents>

Message from job to operator. The job awaits an answer. Use the answer command. The message originates from a "parent message" sent by the job to BOSS. Parent messages are described in ref. [6].

pause <jobname> prepare <remote dev.> { <file name> / primout / jobcontr } segments: <segm>

The message appears on a remote console when output is initiated (a convert) on a remote device which is not a printer. <remote dev.> is the name of the remote device (catalog entry name).

printer <devno> change to <paper type> = <name>

Change the paper in the printer to the paper type specified. When done, type 'start <devno>'.

printer <devno> disconnected

The power has been switched off. When ready again, type 'start <devno>'.

printer <devno> hard error, decimal status = <integer>

The printer has a hardware malfunction. After repair, type 'start <devno>'. The status interpretation is found in appendix C.

printer <devno> illegal command

Kill or repeat attempted on the printer in a forbidden situation.

process too small

Start up error message. BOSS could not start up because of a too small core area. Consult ref. [2].

project number missing

Access codes p and r demand the project number of the job in label and name commands.

<job name> remove ring <tape name> on $\left\{\text{<devno>}\right\}_{0}^{1}$ $\left\{\text{mounts exceeded}\right\}_{0}^{1}$

Remove the write-enable ring on the tape because the job is not allowed to write on the tape. 'Mounts exceeded' shows that the job has asked for too many mountings.

reserve accountfl error

Start up error message. BOSS could not start up because the file for account records could not be reserved for writing. Consult ref. [2].

reserver trouble on <devno>

BOSS cannot reserve the disc drive needed for kit change.

slice table length on <devno>

The chain table of the kit is too long to be held in the BOSS buffer set off for the purpose. Redefine option i15 (cf. ref. [2].

syntax

Forbidden characters or illegal sequence of characters in the command.

syntax at $\begin{matrix}\text{start}\\ \text{job}\end{matrix}$

A batch job or an internal job was not enrolled because of forbidden characters or illegal character sequence in the beginning of the job specification.

table reservation error

Start up error message. Consult ref. [2].

<n> tape jobs waiting

Normal message after 'regret' showing the number of tape jobs still to be loaded in the mode regretted.

tape used by job

Name or label attempted on a tape which is in use.

***test output inactive

Start up warning message. BOSS has switched off the test output generation because of troubles with the file 'bosstest'.

test output on file <n>

Normal message at start up showing that test output is produced on the file shown, in case a magnetic tape is used for testoutput.

<jobname> time exceeded

The job has exceeded the run time stated in the job specification. The job is a long job, and the operator should decide whether the job is to be killed.

time inconsistence accountfl

Start up error message. The last record in the account file has a higher date-time than the clock now. Follow the instruction in chapter 13, or consult ref. [2].

too bad tape on <devno>

BOSS is unable to write a label on the tape because of hardware malfunction. May happen if the mode selected on the tape station does not conform with the mode in the command (label, even, nrz, nrze).

too few <resource name>

Start up error message. Consult ref. [2].

too many bs devices

Start up error message. Consult ref. [2].

transfer error coroutine

Start up error message. Consult ref. [2].

trouble on <devno> { boss not user of device / device reserved by other process }

A job has requested a magnetic tape station that is not available. If BOSS is not user, the reason may be that the link is removed. The operator may decide to kill jobs requesting the station, or let them wait until the station is available again.

type user name and project number

Normal message asking the operator to log in.

usercat incorrect

Start up error message. Consult ref. [2].

usercat input trouble

Start up error message. Consult ref. [2].

user index conflict <user name>

Job or logged in console with the same name and user index already exists. Occurs at login, or at attempt of enrolling a batch job or an internal job.

user index too large <user name>

The user catalog does not allow an index that large. Occurs at login, or at attempt of enrolling a batch job or an internal job.

virt core table too small

Start up error message. Consult ref. [2].

virtual storage too big

Start up error message. Consult ref. [2].

wait

The command "message <jobname> ..." is not executed, as there already was a pending message to the terminal. Try again later.

what?

Unknown command name.

write error on kit on <devno>

The disc kit is too bad to be initialized by 'kitlabel' command.

C. INTERPRETATION OF DEVICE STATUS C.

BIT.NO	1 shift	octal	decimal	name
				Hardware bits:
0	23	4000 0000	8388608	Intervention
1	22	2000 0000	4194304	Parity error
2	21	1000 0000	2097152	Timer
3	20	0400 0000	1048576	Data overrun
4	19	0200 0000	524288	Block length
5	18	0100 0000	262144	End document
6	17	0040 0000	131072	Load point
7	16	0020 0000	65536	Tape mark/Attention
8	15	0010 0000	32768	Writing enabled
9	14	0004 0000	16384	Mode error
10	13	0002 0000	8192	Read error
11	12	0001 0000	4096	Disc error/Card reject
				Software bits:
12	11	0000 4000	2048	Checksum
13	10	0000 2000	1024	Bit 13
14	9	0000 1000	512	Bit 14
15	8	0000 0400	256	Stopped
16	7	0000 0200	128	Word defect
17	6	0000 0100	64	Position
				Monitor results (5-1):
18	5	0000 0040	32	Process does not exist, result = 5
19	4	0000 0020	16	Disconnected/Malfunction, result = 4
20	3	0000 0010	8	Unintelligible, result = 3
21	2	0000 0004	4	Rejected, result = 2
22	1	0000 0002	2	Normal, result = 1
23	0	0000 0001	1	Hard error (giveup)

RETURN LETTER

Title: BOSS
Operating Guide

RCSL No.: 31-D680

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