Subject
RC890-30 CU Basis Software, rel. 1.0, package description

Package name

Sales designation:	RC890-30 CU Basis Software
Sales number:	SW8930
Release:	Rel. 1.0
Which replaces:	None

Package contents

Software:　　　　　2 diskettes - the two diskettes are ident-
　　　　　　　　　　ical, one should be kept in reserve - with
　　　　　　　　　　files for:

RC890-30 Control Unit (CU) operation

- monitor program:	S	
- RcCircuit comm.:	CIRC.COM	
- downline loader:	MDLL.POF	
- install program:	INSTALL.POF	
- parameter files:	CONFIG.CST	SYS.CST
- auxiliary files:	DEFAULT.MDL	DMENU.MDL

RC45 / RC855 work station (WS) operation

- file inst. prog.:	INSTALL.S45	INSTALL.855
- CST inst. prog.:	CSTINST.S45	CSTINST.855
- file editor:	EDIT.S45	EDIT.855
- configurator,		
- IBM aMSI comm.:	CONI.S45	CONF.855
- non-comm.:	CONFILE.S45	

Documentation:　　　1 binder - with user guide for

RC890-30 Control Unit (CU) operation

(supplement as:)	SW8930-D
- manual ident.:	PN 991 10777
- edition (update):	Apr 1987 (0/87)
- language:	English

Requirements

General

Control unit (CU):	RC890-30
- memory:	120 Kb

RC45 / RC855 Work Station operation

CU adapter:	TF831 or TF832
- cable:	TF673 - or equivalent
Terminal network:	RcCircuit (1)

Other requirements as described for the communication software
package in question.

Subject	
RC890-30 CU Basis Software, rel. 1.0, package description	

Installation

The SW8930 CU Basis software package comprises two identical diskettes - one of these is kept in reserve, the other can right away be used as CU system diskette. The programs on the system diskette are executed by the RC890-30 control unit, except for the programs for RC45/RC855 work station operation which are only contained in order to be downloaded and executed by the work stations.

The communication software packages in question for the system are installed on the CU system diskette. Installation procedures are described in the user guides for the communication software and for the RC890-30 Control Unit in sections C.

The CU basis software is customized for the installation in question by means of the configuration file CONFIG.CST and the the parameter file SYS.CST - check as follows:

CONFIG.CST   - configuration switches must be set to invoke
                the communication sub systems installed.

SYS.CST   - a) <u>for operation on LAN (Local Area Network)</u>:
               A unique value must be assigned to (each)
               CUIDENT parameter (in the LAN environment).

            b) <u>for operation on RcCircuit I</u>:
               The number of work stations (and other
               equipment units) which are connected and
               which should be polled must be stated in
               the NOTERM parameter.

The download procedure can be customized in the parameter file MENUDL.CST. Two auxiliary files - DEFAULT.MDL and DMENU.MDL - are included to provide for an easy set-up of customized specifications (with English / Danish menu texts, respectively); edit and rename one of them to be the parameter file.

The aspects in customization are covered by the user guide for the RC890-30 Control Unit in section D.

Description

The programs coming with the SW8930 RC890-30 CU Basis software package can briefly be described as follows:

Programs for RC890-30 Control Unit operation

o *Monitor program (S)* - provides for the monitor function which allow a number of communication sub systems (IBM, UTS, Asynch. Gateway, ...) to be executed simultaneously.

Subject

RC890-30 CU Basis Software, rel. 1.0, package description

---

o *RcCircuit communication (CIRC.COM)* - provides for the software which allow a number of RC45/RC855 work stations (and RC4516 converters) to communicate with the CU by means of the RcCircuit I terminal network.

o *Downline loader (MDLL.POF)* - provides for the handling of terminal function menu operations from RC45/RC855 work stations as specified by default or in the parameter file MENUDL.CST.

o *Install program (INSTALL.POF)* - provides for the installation of software packages on the CU system diskette according to specifications in an INST.JOB file on the source diskette.

Programs for RC45/RC855 work station operation

o *File Installation program (INSTALL.*)* - used for installation of single files on the CU system diskette, one at a time.

o *CST file installation program (CSTINST.*)* - used for installation of a bulk of customization parameter files (*.CST files) on the CU system diskette.

o *File editor (EDIT.*)* - used for editing and otherwise manipulating files on the CU system diskette.

o *Configurators (CONFI.* & CONFINE.S45)* - used for setting work station customization parameters.

CONFI.*   - apply to IBM/ANSI communication parameters besides of general work station parameters.

CONFINE.S45 - apply to general work station parameters. Available for the RC45 work station only.

User Guide

for

RC890-30 Control Unit

April 1987
PN 991 10790
Development Department
RC Computer a/s

Foreword

Please, allow for a few general words about the User Guide
... about how it is structured and updated, and how the
pages are identified. And last, but not least, how you, the
user, can help to make it more useful.

Structure

In principle, a User Guide comprises eight main sections (A
... H), covering the areas:

A. Introduction
B. System Overview
C. Installation
D. System Customization
E. System Management
F. Normal Use
G. Miscellaneous
H. Appendices

Their contents are summarized **for the particular User Guide**
in section A: This guide.

In a User Guide you may find "empty" main sections, as the
manner in which the main sections are utilized is dependent
on the individual product.

Page identification and insertion

At the top of the page is a line in bold face containing the
product name, main section title, and main section letter.
At the bottom of the page a similar line shows the update
number, page number, and main section letter.

The pages are succesively numbered within a main section/-subsection. When inserting in the loose-leaf binder, place the main sections under the tab sheets according to letter; the table of Contents (and possible Indexes) are placed in front of tab sheet A.

Updating

In general, a User Guide is updated by publication of a new document; in addition, ammendment and correction pages may be published together with the Package Description coming with a new release of the product. The latest Update Overview included with the Ammendment & Correction (A&C) Sheet Sets should be inserted under the according tab sheet.

User comments

We wish to make our User Guides as useful as possible. We should therefore appreciate your critical evaluation of this User Guide, and urge you to make use of the enclosed questionnaire ("Return Letter").

Yours truly,

RC Computer a/s
Editorial Staff

RC890-30 Control Unit

CONTENTS

(Return Letter enclosed as last **page**)

Contents

Figure

number	Figures, illustrations and tables	Page number

Index of names of files and parameters

Index of displayable texts messages

The RC890-30 Control Unit is a multi-function controller which mediates communication between host computers and clusters of terminal devices in that it executes communication control programs, supporting the communication disciplines in question.

The RC890-30 is adapted for the communication tasks by selection of appropriate software and hardware modules - as factory built, the control unit covers only the basic functions in operation, e.g. utility programs for configuration and installation, and features one synchronous host communication port - an approach which provides for an optimum degree of freedom in designing system solutions; areas covered by optional selections are:

o   Synchronous communication

o   Asynchronous communication

o   LAN (Local area network) communication

o   Terminal network communication

o   Extended basic features

o   Communication software

In mediating communications, the RC890-30 has no visible functions to users of terminal devices; it just allow for cummunications to take place between host computer-based applications and a number of devices. A host computer connection may be remote, utilizing telephone lines or other public data network structures, or local, utilizing a LAN.

Terminal devices for the various communication disciplines are emulated on RC work stations and personal computers. RC work stations are connected to the control unit by means of the terminal network, RcCircuit, whereas RC personal computers utilize LAN, Local Area Network, communication.

The RC890-30 itself, utilizing LAN communication, can co-exist with other RC890-30's as well as with the RC891 Control Unit on the same LAN.

The RC890-30 control unit (CU) can work with different control programs (CP) simultaneously, supporting different ways of cummunication (IBM, VT100, UTS, ...). RC work stations (WS) and personal computers (PC) must work with terminal programs (TP) corresponding to the control program by means of which they communicate with the host computer - doing so, they are referred to as (IBM, VT100, UTS, ...) terminals. The abbreviations are often used for short when referring to general properties of the products; referring to specific properties, the abbreviations are denoted by the prefixes IBM-, VT100-, UTS-, ...

To maintain high flexibility in designing system solutions, the RC890-30 offers a series of support levels, ranging from 12 to 128 sessions, which determins the number of devices that can simultaneosly be active in communication - this assures an optimum in performance - and cost - for the payload in question.

This guide

This guide describes the basic RC890-30 control unit and the attentendance required in day-to-day operation and in setting-up the system to suit specific needs of the actual installation.

During ordinary operation, the control unit works unnoticed by terminal users and, further, it serves a number of users; so, in this guide, one user at the CU site is appointed the *system administrator*, whom we think of as the one responsible for the attendance described. Most of the tasks con-

cerning the control unit (and the control programs, for that
matter) naturally belong to the responsibilities of a system
administrator. The tasks must not necessarily all be carried
out by the same person, although such an arrangement would
be very practical. (The tasks are obvious subjects for an
possible in-house computer operation department).

Besides of this introduction (section A), the user guide
contains the following main sections:

B - System Overview
     A brief general description of the control unit, the ba-
     sic and optional features. A brief walk-through of the
     major aspects in system operation and set-up.

C - Installation
     Describes the installation of the hardware, as general
     concerns and as a view of the connections and control
     facilities on the CU back plane; describes the procudere
     for installation of software on the CU system diskette.

D - System Customization
     Describes the generally applicable form (syntax) for the
     text files, which are used to control the system oper-
     ation at specific level. For the CU files, concerning
     configuration and terminal download, specifications are
     given.

E - System Management
     Gives a general overview of the tasks in system admini-
     stration, including practical aspects on finding and
     editing text files on the CU system diskette; summary of
     aspects in managing addresses and device identifica-
     tions. Describes the RC890 Editor, a utility program for
     editing the text files.

F - Normal Use
Operating guidance with description of start/reset and
status information (lamps on the CU cabinet and CU er-
rorlog file) for use in error reporting. Abnormal cir-
cumstances during operation may be indicated on the sta-
tus line of terminal devices by messages originating
from the CP/CU system; messages from the CU basic system
(concerning terminal download) are described.

G - Miscellaneous
Short notice on general maintenance. Description of spe-
cial operating procedures, concerning: configuration er-
ror recovery; start from console.

H - Appendices
Connector interface standards.

Other guides
The user guide at hand only covers the more general aspects
in operation and set-up of the system of control unit, con-
trol program and terminal program - for the specific infor-
mation, one must turn to the user guides:

o *for control programs* - regarding specific installation,
customization and operating procedures, which determins
the behaviour of the control unit in actual use. The
control programs are specific for the type of communica-
tion in question. More than one guide may be needed to
cover the overall system behaviour.

o *for terminal programs* - regarding the specific functions
of terminal (and printer) devices in use with the commu-
nication discipline in question. Different terminal pro-
grams (and user guides) apply to one type of communica-
tion, when using RC work stations and RC personal com-
puters, respectively.

This main section gives a general description of the RC890-30 control unit, the basic and optional features, and of some major aspects in set-up and operation of the system of control unit, control programs and terminal programs viewed as a whole.

Control unit

The RC890-30 control unit is a self-contained unit of small measures, suitable for desk-top or shelf location, with a built-in diskette drive.

On the CU front panel you find a row of eight small lamps which are used to signal status information during –

- software installation procedure: see section C.2;
- selftest and normal use: see section F.1.

The power break switch is located on the front as well; a brief description of the connectors and other controls on the back plane of the CU is found in section C.1.

Hardware as well as software for the RC890-30 is modular structured; the overall outline of the functional areas could be schematically shown as in figure B-1 (overleaf).

The specific functions of a system are obtained by adding modules to the basic unit. Hardware-based functions are installed by RC technicians, whereas software modules can be installed by the user as needed.

```
                              host _____    host ____
                              V.24 / X.21     gateway
         Communication ports:  synch.         asynch.

                                  ||            |||
                              ┌──────────────────────────┐
                              │                          │
                              │  Basic features          │
                              │  Control programs        │
                              │  (Terminal programs)     │
                              │                          │
                              │                          │
                              └──────────────────────────┘
                                  |              |

  Local network connections:  LAN _____    RcCircuit___
                              device (PC)    device (WS)
                              host
```
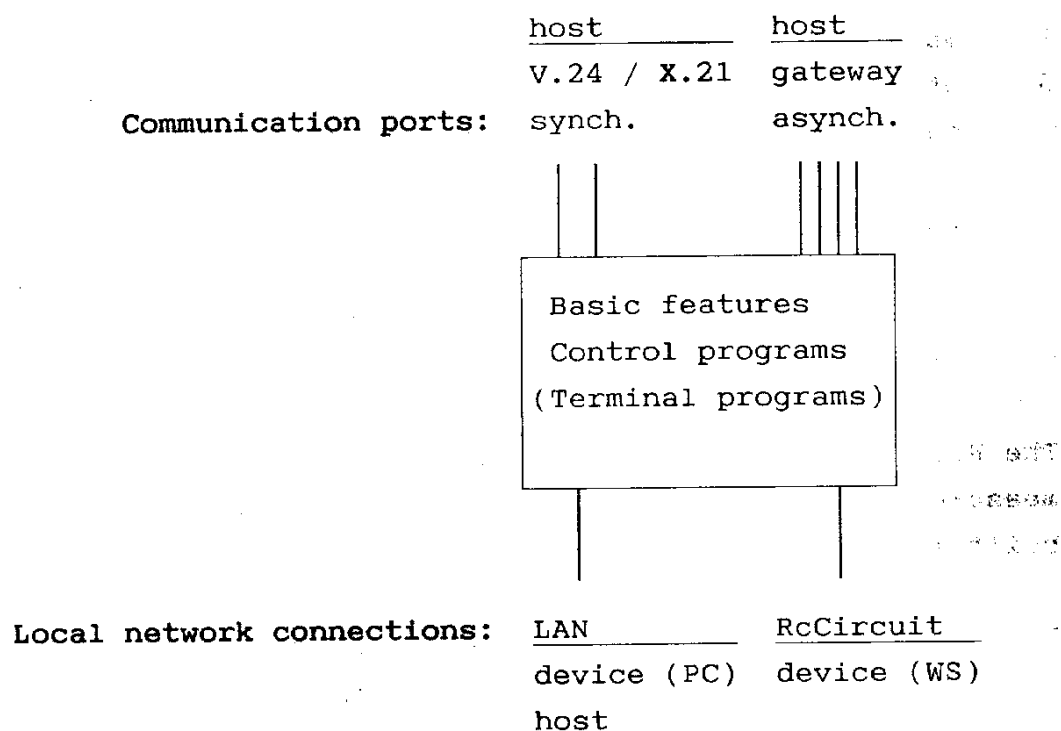
Figure B-1: **Overall functional** outline of RC890-30 CU.

Basic features and extensions
The RC890-30 is furnished with basic **features as follows:**

  o 512 Kb memory; extendable to 768 Kb.

The execution of a control program requires a minimum free
memory area as stated in the software package description
coming with the specific communication software. The memory
installed must cover the requirements of all control pro-
grams concurrently in operation.

  o Support level for 12 simultaneous sessions; extendable to
     32, 64 or 128 sessions.

A session is required for each active device, which is the logical entity in the communication system and which can be a terminal or printer device. A terminal device is always active once its identification is defined; a printer device need not be. RC work stations and personal computers can be working as more than one device and, consequently, require more than one session. All devices of the different communication disciplines performed must be covered by the support level number.

   o CU basis software, i.e. basic operating system, programs for software installation and text file editing as well as other system utilities.

For specific system operation, the software must be "extended" with communication control programs and, possibly, terminal programs (for download to work stations).

Communication ports

The utilization of the communication ports is determined by the control programs and communication protocols; for specific information, see user guide to the control programs.

   o Synchronous V.24 / X.21 ports; 2nd port optional.

Connection of remote host computers by V.24 modem or X.21 DCE facilities. Communication speed may be rated up to 19200 bps.

Different communication forms may be used on each of the ports or the same may be used on both (depends on control programs).

The synchronous ports are accessible to devices on RcCircuit I (RC45 WS, RC855 WS, RC4516 converter) and LAN (RC750 PC).

o Asynchronous gateway ports; optional.

These ports are used for connection of host computers, as
for example the RC39 multi-user computer and DEC VAX com-
puters - however, the ports are general of nature so that
terminals as well may be connected. Communication speed may
be rated up to 9600 bps. The option comprises 4 ports.

Communication on the asynchronous ports is transparent to
the CU; configuration and reservation of communication lines
is performed by a control program executed on the CU and re-
quires that the equipment comply with a few ANSI X3.64 con-
trol sequences (i.e. work VT100-like).

The asynchronous ports are accessible to devices on RcCir-
cuit II (RC45 WS, RC4516 converter).

Local network connection
Facilitates connection of local host computers and - notably
- equipment which emulate the devices working for the commu-
nication in question. The utilization is determined by the
communication control program and the terminal programs. All
of the local network connection facilities are design op-
tions - however, one of the facilities must be installed for
the system to work.

o LAN adapter (RcMicronet, Cheapernet, Ethernet); optional.

Connection to local host computers (RC8000, RC39), to other
control units (RC890-30, RC891) and to personal computers
(RC750 Partner). The option must be specified as RcMicronet,
Cheapernet or Ethernet. The control unit can handle up to
100 stations/addresses on the LAN.

Support of local host computers on LAN depends on the control program on the control unit; se user guide to control program.

RC750 personal computers must work with a terminal program that matches the control program by which the access to the communication ports is handled. The terminal program for the RC750 is installed locally. Some control programs feature *soft devices* which allow for an application program on the RC750 to gain access to the host computer communications, rather than usually the terminal program; see later subsection on Devices.

   o RcCircuit I communication controller; optional.

Connection to work stations (RC45, RC855, RC4516 converter) which emulate devices for the communication in question (block-oriented). The control unit can handle up to 32 addresses on RcCircuit I, which operates as integral part of the RcCircuit terminal network installation; see below subsection.

The work stations must work with a terminal program that matches the control program in question. Terminal programs for the work stations are installed on the control unit and downloaded to the work station (the relevant terminal program may in some cases be built-in (prom-based) on the work station).

Terminal devices operating on RcCircuit I access the synchroneous communication ports.

o RcCircuit II communication controller; optional.

Connection to work stations (RC45, RC4516) which operate as
devices for the communication in question (character-orient-
ed). The control unit can handle up to 32 addresses on
RcCircuit II, which operates as integral part of the RcCir-
cuit terminal network installation (of newer date or refur-
bished); see below subsection.

The work station must work with a terminal program which
matches the host computer in question; the communications on
RcCircuit II take place without participation from the con-
trol unit once the system is set-up; see user guide to the
asynchronous gateway function of the control unit. Provided
that the RcCircuit I adapter is installed, terminal programs
for RcCircuit II operation may well be installed on the con-
trol unit and downloaded to the work stations; often the
terminal program is built-in (prom-based) on the work sta-
tion, however.

Terminals operating on RcCircuit II access the asynchronous
communication ports.

RcCircuit. The terminal network, RcCircuit, is a multidrop-
ped 4-line (two twisted-pairs) installation. RcCircuit I for
block-oriented communication and RcCircuit II for character-
oriented communication uses each one set of the twisted
wire-pairs and are both integrated in the same connector.
Older installations, consisting of one wire-pair for RcCir-
cuit I operation, may be refurbished by adding an additional
wire set and replacing the connectors (utilizing RcCircuit I
operation only they may be used as is).

Devices

Terminal and printer device functions for the communication
in question are accomplished by executing terminal programs
on RC work stations or personal computers. The functional
outline could be schematically depicted as shown below.

D = Display device
P = Printer device
SD = Soft device

```
                                    ┌─────────────────────┐
                                    │ RC890-30 CU         │
                                    │ RC890 CP            │
                                    │ (RC45 TP)           │
                                    │            ┌────┐   │
                                    │            │ SD │   │
                                    └────────────┴────┴───┘
                                         │              │
                                         │              │
            Local Area Network           │         RcCircuit
    ═════════════════════════════════════╪══════        │
              │                                           │
              │                                           │
   ┌──────────────────┐   ┌────────┐                      │
   │ RC750 PC         │   │        │                      │
   │ RC750 TP         │───│   P    │                      │
   │   D   (appl.)    │   │        │                      │
   │   D    D         │   └────────┘                      │
   └──────────────────┘                                   │
                                                          │
                                      ┌────────┐   ┌──────────────┐
                                      │        │   │ RC45 WS      │
                                      │   P    │───│   D          │
                                      │        │   │   D          │
                                      └────────┘   └──────────────┘
```
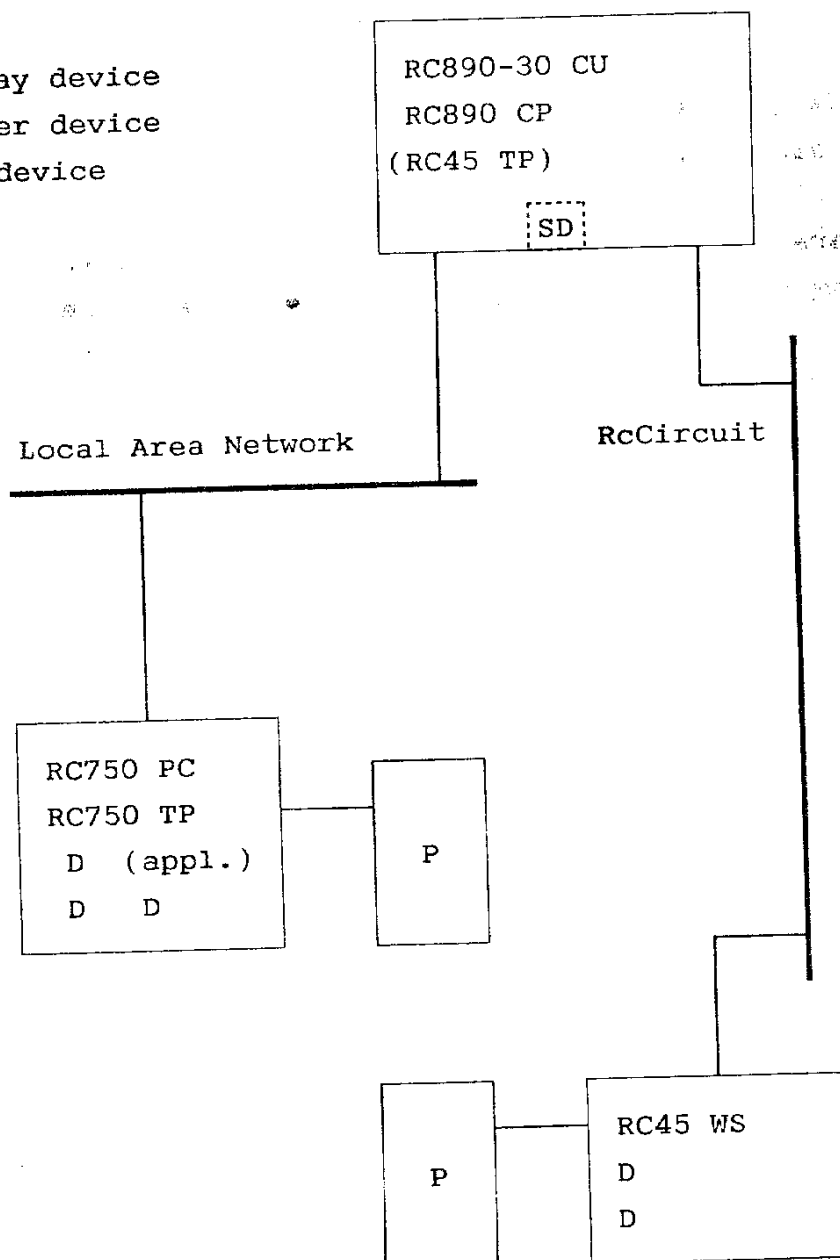
Figure B-2: Devices, **example** (principally).

Work stations (on RcCircuit) and personal computers (on LAN)
may be freely mixed in forming a cluster of devices within
the range of available device identifications as supported
by a control program.

More than one device may be accomplished on the same physi-
cal unit (two on a WS and four on a PC), depending on the
control and terminal programs. Control programs are avail-
able which allow for a combination of communication disci-
plins so that each device communicates in accordance with
the discipline selected for it.

Generally, the CU being able to execute several control pro-
grams concurrently, work stations and personal computers can
utilize any of the corresponding cummunication disciplines
in turn by loading the appropriate terminal programs.

Some control programs feature so-called *soft devices* which
towards the host computer behave like a terminal device.
Soft devices are accomplished on the CU and they allow for
application programs on personal computers to access host
computers as if they were terminal operators.

Asynchronous terminal equipment can be used on RcCircuit by
means of the RC4516 converter in which case the devices - in
the above sense - are accomplished on the converter.

Customization

The system of control unit, control programs and terminal
programs is tailored to specific needs of the particular in-
stallation by customizing a number of parameter specifica-
tions.

For the control unit and control program operation this is
done by editing a number of text files on the CU system
diskette. Generally, system operation is based on a set of
default specifications. In customization, text files are
edited so as to contain those (customized) specifications
for which the defaults are not suitable (/not specified),
successively the edited text files are stored under well-
defined file names on the CU system diskette. Starting - or
resetting - the CU, the customized specifications as far as
present take effect over the defaults.

Some text files, one of which is referred to as configur-
ation file, are distributed and customized for the system as
such; other files are specific for the control programs and
referred to as parameter files. For most of the parameter
files, some auxiliary files are additionally included to
serve as a convinient means in creating customized specifi-
cations.

General aspects in customization are described in this
guide, in section D, together with the specific aspects re-
lating to customization of the RC890-30 CU (configuration
and terminal download); specific aspects of control program
customization is described in the user guides for the con-
trol programs.

Customization of device identifications is one major aspect
which is not covered by the CU (or CP) customization, but is
configured at the individual work stations and personal com-
puters, working with the corresponding terminal program.
(Soft device identifications - as the exception - are speci-
fied as parameters of the CP to which they belong).

Terminal configuration is described in the user guides for
the terminal programs.

This main section deals with the installation of hardware and software.

Hardware is normally installed by RC technicians and the description in this section only covers some general considerations, regarding location and cable connections, which allow the system administrator to check for obvious errors in case of malfunction of the system. See section C.1.

Software for the different communication tasks must be installed on the CU system diskette. The installation procedure is described in section C.2.

C.1 Hardware installation

As mentioned above, the present brief description only intends to enable a quick check of cable connections and environmental conditions in order to avoid malfunction due to obvious errors.

Location

The environment on the installation location should be kept to conditions as follows:

- provide for ample space around the equipment so as not to obstruct heat dissipation.

- ambient temperature and air humidity should be kept within reasonable range of 21°C og 50% RH (relative humidity). This ensures a fair cooling of the equipment and reduces the liability for generation of static electricity.

- the equipment is connected to a power outlet, preferably
  of a power circuit exclusively used by computer equip-
  ment. In any case the power circuit should be kept clear
  of electric devices with frequent start/stop duty cycles,
  as for instance refrigirators and copy machines.

CU back plane

┌─────────────┐
│ NOTICE !   │ Switch off power before (dis)connecting any of
└─────────────┘ the cables - switch off on the CU as well as
                 on the equipment unit which is to be (dis)con-
                 nected.

                 The power switch of the CU is located at the
                 front panel.

Connectors and special controls are located on the back
plane as follows:
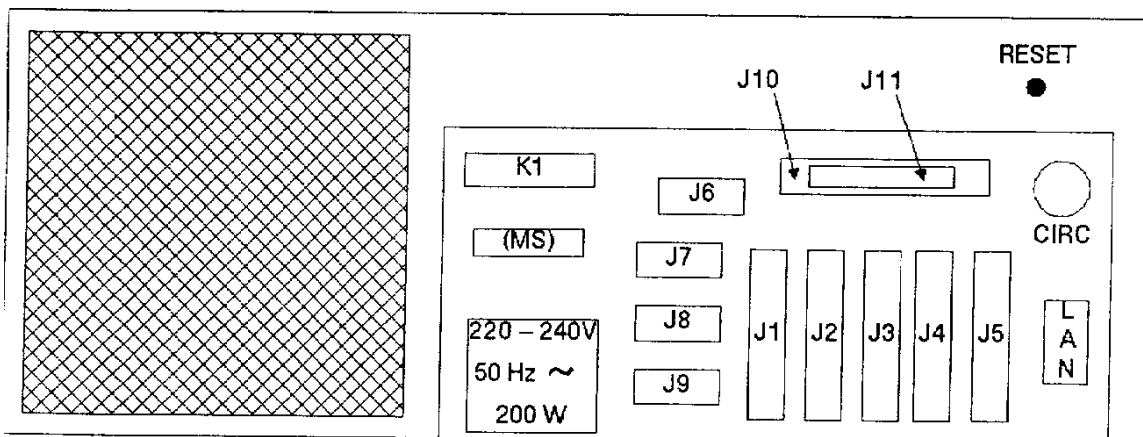
Not drawn to scale

220-240 V
50Hz ~
200 W

Mains power connector. Two separate power cables are delivered with the CU; one is used with Danish power outlets, the other applies in general, internationally.

(MS)

Mode selector (not labelled). Dial switch for selection of basic operational mode by turning the wheel to one of the positions as follows (0/1/2/../9/A/../F):

0 : normal use.
1 : configuration (special) - see section G.
2 : software installation - see section C.2.
others : not used.

K 1

Connector for console - see section G.

J6..J9

Connectors of asynchronous gateway ports; V.24 interface is described in Appendix H.1. For specific use, see user guides to control programs.

J1..J5

Connectors of synchronous V.24 / X.21 ports; V.24 / X.21 interfaces are described in Appendix H.1. For specific use, see user guides to control programs.

J10, J11

Connectors not used.

LAN

Connector of LAN, Local Area Network, **adapter**; see discussion of use in section B.

CIRCUIT

Connector of RcCircuit communication controllers (RcCircuit I & II integrated in same connector); see discussion of use in section B.

C.2 Software installation

The communication software for RC890-30 control unit oper-
ation is distributed on diskette and the files from the di-
stribution diskette must be transferred to the CU system
diskette. This is done by means of installation programs
which are part of the basic software on the system diskette.

The different installation programs apply in situations as
follows (procedures are described in the subsections indi-
cated):

(C.2.1)   Installation program
          Used for transfer of bulks of files from a source
          (/distribution) diskette to the CU system diskette.
          Transfer is controlled by means of a text file
          (INST.JOB) written on the source diskette; the text
          file can be edited to omit transfer of files which
          are not wanted on the CU system diskette.

          The CU system must cease normal operation while
          software is installed. Operation is controlled by
          the mode selector at the CU back plane.

          Typical use: Installation of entire software sys-
          tems.

(C.2.2)   RC890 Install program
          Used for transfer of single files, one at a time,
          from a source (/distribution) diskette to the CU
          system diskette. Transfer is controlled by operator
          commands from a terminal; the install program
          (INSTALL.*) must be downloaded to a work station
          (RC45 or RC855) for operation.

The CU system can continue normal operation while
software is installed. Download of the install pro-
gram is controlled from the terminal function menu
(the program is made available for a work station
by definition in the parameter file MENUDL.CST).

Typical use: Installation of terminal programs or
selective files from a system.

(C.2.3)   RC890 CST file install program
            Used for transfer of a bulk of *.CST files, from a
            source (/distribution) diskette to the CU system
            diskette. Transfer is controlled by operator com-
            mands from a terminal; the CST file install program
            (CSTINST.*) must be downloaded to a work station
            (RC45 or RC855) for operation.

The CU system can continue normal operation while
software is installed. Download of the install pro-
gram is controlled from the terminal function menu
(the program is made available for a work station
by definition in the parameter file MENUDL.CST).

Typical use: Installation of previously customized
parameter files on new CU system diskette.

C.2.1   Installation program

The installation program is invoked by selecting the software installation mode of operation on the dial wheel switch on the back plane of the CU (see section C.1) and reset the CU. Throughout the installation procedure, the lamps on the front of the CU are used specifically to inform you of the status of the procedure and the steps to be taken next.

The installation program detects which diskette is the distribution diskette by the presence of the name of the installation text file (INST.JOB).

Installation file

The installation text file on the distribution diskette contains a list with the specific names of all files that are to be transferred to the system diskette. A file transferred to the system diskette overwrites a previous file of that name on the system diskette. If files are not to be transferred to the system diskette, the names of these files must be deleted in the installation file on the distribution diskette.

The installation file can be edited and manipulated like **any** other text file (cf. section E):

```
name of installation file: INST.JOB
     specification formats: <file name><line feed>
                            <file name>;<comments><line feed>
                            ;<comments><line feed>
```

File names must include the file name extension (like ".JOB" in INST.JOB).

An installation file may be written on any CU diskette and
will allow for the specified files to be transferred to the
CU system diskette (not holding an installation file). This
way files may be transferred from an old to a new CU system
diskette by writing an INST.JOB file on the old one.

Handling of customized files

If a new release of the communication software contains
files for the customization of parameters (*.CST files -
check with package description coming with the release),
these files will overwrite already customized files (of the
same specific file names). If this is not acceptable, delete
the appropriate *.CST files in the installation file.

Beware, however, that new releases may contain new aspects
in customization that are essential to correct system oper-
ation - in any case check with the package description. See
also discussion of customization in section E.

Installation procedure

CU rear
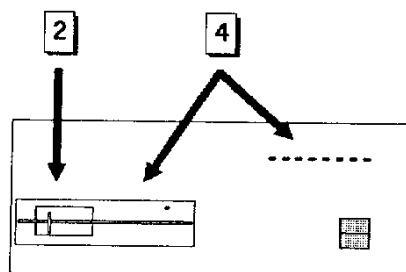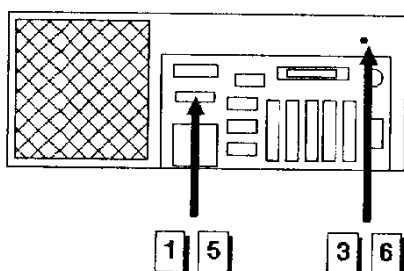
CU front

Proceed as follows (steps are indicated on the illustrations
of CU rear and front on previous page, too):

1) Select installation mode: Mode selector (CU rear) set to
   position 2.

2) Insert system diskette.

3) Restart CU: Press RESET push-button (CU rear).

4) Watch the indicator lamps (CU front) and do as follows:

READY TEST ERROR RETRY   (● = lit)

READY	TEST	ERROR	RETRY	
●	●	●	●	Lamps lit for 5 sec. initially.
O	●	O	O	Insert distribution diskette.
O	O	O	●	Insert system diskette.
O	●	O	O	Insert distribution diskette.
O	O	O	●	Insert system diskette.
				...
●	O	O	O	Installation completed.

Errors during the installation procedure is indicated by
the lamps as follows:

READY	TEST	ERROR	RETRY	
O	O	●	O	Error, specifically:
●	O	●	O	- system diskette full;
O	●	●	O	- diskette error;
O	O	●	●	- file not found;
●	●	●	O	- inst.job file empty;
●	O	●	●	- inst.job file error: illegal or unknown file name;
O	●	●	●	- system diskette removed illegally.

In case of an error, the installation procedure has to be
started all over. This is also the case, if a wrong di-
stribution diskette accidentially has been inserted in-
stead of the correct one during any part of the pro-
cedure. See also below: Error handling.

5) Select mode of normal use: Mode selector (CU rear) set to
position 0.

6) Restart CU: Press RESET push-button (CU rear).

Note that the term *distribution diskette* is used in general
in this description for the diskette from which the files
are transferred to the CU system diskette; this may be any
CU diskette on which an installation file has been speci-
fied.

Error handling
Some of the error situations may occur due to simple reasons
as follows:

o *System diskette full* - delete some of the superfluos
files, e.g. ERRORLOG and ERRORLOG.BAK, and repeat the in-
stallation procedure.

o *File not found / inst.job file error* - check for correct
spelling of file names in the installation file; repeat
the installation procedure.

o *System diskette removed illegally* - keep sequence in
exchanging distribution (/source) diskette and system
diskette; repeat installation procedure.

If an error is encountered during the installation pro-
cedure, i.e. the distribution (/source) diskette has been
inserted and has been exchanged with the system diskette at
least once before the malfunction occurs, then the system
diskette most often contains some of the "new" files. Now,
suppose you are about to install a new version of a pre-
viously installed communication package, this could mean
that some of the files of the communication system are from
the new version while others are from the old one. Though
looking right when checking the directory (file names are
normally the same in new and old versions), such a system is
of course inconsistent. Therefore, it is essential that the
installation procedure is repeated in case of errors.

C.2.2   RC890 Install program

The RC890 Install program is invoked by selection in the
terminal function menu on the work stations to which the
program (INSTALL.*) has been included in the download menu
by definition in the parameter file (MENUDL.CST). This pro-
cedure is the same as for other terminal programs; it is de-
scribed in section D.2.2.

The install program allow one file at a time to be transfer-
red form a source (/distribution) diskette to the CU system
diskette. The maximum size of a file to be handled is 42.5
Kbytes.

Installation procedure

The install program operation is guided by text messages on
the display screen - go ahead as follows:

(0) Insert system diskette at CU and invoke install program
    in terminal function menu.

  1) Initially the promting messages are:

     RC890 Install Program

     Change diskette and type filename:

  2) Remove the system diskette and insert the diskette con-
     taining the file to be installed - type the name of the
     file terminated by <return> key.

     The relevant file names are listed in the software pack-
     age descriptions.

3) While reading the file, the program displays the mess-
   age:

   Reading file: <file name>

   When the file has been successfully read, the following
   is displayed:

   Mount RC890 diskette, and type filename:

4) Remove the source diskette and insert the CU system
   diskette - type the name by which the file should be
   known on the CU system diskette terminated by <return>
   key.

   If the same name is to be used as on the source
   diskette, just press the <return> key.

   If a file exists already with the specified name, it is
   overwritten; otherwise a new file is created.

5) While writing the file, the program displays the mess-
   age:

   Writing file: <file name>

   When the file has been successfully written, the follow-
   ing is displayed:

   Install complete - continue y/n?

If typing:

y(es) - the installation procedure is repeated, making
it possible to install another file;

n(o) - the installation procedure is terminated and
the terminal returns to the terminal function
menu.

Error handling
If an error is detected during installation, an error mess-
age is displayed. After displaying the error the program
will wait for something to be typed:

Ctrl+Clear - causes the installation to be abandonned; the
terminal returns to the terminal function
menu.

other key - causes the failing step of the installation
procedure to be repeated.

C.2.3   RC890 CST File install program

The RC890 CST File install program is invoked by selection
in the terminal function menu on the work stations to which
the program (CSTINST.*) has been included in the download
menu by definition in the parameter file (MENUDL.CST). This
procedure is the same as for other terminal programs; it is
described in section D.2.2.

The CST file install program allow for *.CST files to be
transferred form a source (say, an old CU system) diskette
to the CU system diskette. The program can handle up to 10
files at a time, providing the total size of the files does
not exceed 40 Kbytes.

Operations during installation

The function to be performed by the CST file install program
is selected from a menu which is displayed when the install
program has been loaded:

```
   RC890 CST-File Install Program



        Select function:


        1 Read CST-Files
        2 Write CST-Files
```

eneral   - the install program is operated as follows:

numeric keys : selects function (1..2); selection can be
                made whenever the text "Select function:" is
                displayed.

   Ctrl+Clear : returns from install program menu (at any
                time) to terminal function menu.

Read CST-Files
(1)   - selecting this function, makes the install
                program read the customization files (*.CST
                files) on the diskette currently mounted in
                the CU disk drive.

                Maximum 10 files of total size 40 Kbytes.

                The program displays the name of the file it
                is currently reading and maintains a list of
                the files read so far.

Write CST-Files
(2)   - selecting this function, makes the install
                program write the read files on the diskette
                currently mounted in the diskette. Note that
                the write function does not ask for any in-
                formation, but immediately on selection it
                starts writing on the diskette.

                Nothing is changed in the buffer with the
                read files due to writing, so they may
                becopied to as many diskettes as desired
                merely by exchanging diskettes and reselect
                the write function.

Error handling

If an error occurs, appropriate self-explaining messages
will be displayed. Pressing any key, stops the operation and
the program returns to the initial menu. If the error occur-
ed during a read operation, the list of files read is updat-
ed to comprise onle those files which have been read before
the malfunction.

The system of RC890-30 control unit and RC890 control pro-
grams can be configured and customized in a simple and flex-
ible manner. All information concerning the configuration
and customization is collected in a number of text files
which are read by the CU when its software is loaded.

The term configuration is used to refer to the selection of
CU functions. The configuration of a CU determines which
software modules are loaded and activated. By customization,
on the other hand, we refer to the control at a detailed
level of operational parameters for the modules which have
been selected for a configuration.

There is one file, the *configuration file*, which contains a
description of the CU configuration, and a number of files,
the *parameter files*, which contain specifications of custom-
ization parameters. This main section is concerned with the
general form (syntax) of these files and the meaning of the
contents of those files which are distributed as part of the
CU basic software; in general, parameter files are discussed
in the user guide for the software module to which the par-
ameter specifications belong. Practical aspects, such as
finding the files and editing them, are discussed in main
section E.

Whenever the CU is reset, an initial program is executed
which reads the configuration file, determines which soft-
ware modules to load, and then reads the parameter files to
obtain parameters for the activation of these modules. De-
fault values for all the parameters are built into the in-
itial program, and these values remain in effect in all
cases where no modification is read from the appropriate
parameter file. Consequently, the parameter files need only
contain specifications of deviations from the default par-
ameter values for those functions which are active.

As a general rule all the files have a name of the form
*.CST, where * stands for some sequence of letters, and CST
is intended as a mnemonic for "CuSTomization". Similarly the
* part of the name is chosen so as to give a clue to the
subject of the contents of the file.

Another rule is that semicolons (;) may be used in the files
to introduce comments; i.e. the part of a text line which
follows a semicolon is ignored, when the files are read dur-
ing load of the CU, and may contain explanatory information
for the system administrator who will be responsible for
editing the files.

D.1 Configuration file

File name: **CONFIG.CST**

The configuration file is a list of so-called configuration
switches, each of which causes a particular function or set
of functions to be activated or deactivated.

In the distributed version the file contains comment lines
only (which makes the file largely selfexplanatory). The
configuration switches actually required for system oper-
ation must be must be added to the file.

Configuration file syntax

Syntactically, a configuration switch is just a sequence of
characters; some of the switch names used are identical with
the file names of the subsystems distributed as *.POF files.
In the list, the configuration switches may be separated by
commas (,) and/or newline characters. Semicolons (;) intro-
duce comments.

Configuration switches

The actual switch names for activation of particular func-
tions are described in the user guide for the control pro-
gram to which the function belong.

The distributed version of the CONFIG.CST file contains no
switches. The basic functions (belonging to the basic soft-
ware system) are, but one, all activated by default, since
they are normally always required to be active. It is poss-
ible, however, to deactivate these functions by adding con-
figuration switches to the file as described below.

Acceptable configuration switches with respect to the basic
CU system software are as follows:

Switch	Function
INFO	- activates the extended *CU log file* function, which provides for additional system information (addresses) compared with the usual CU log file; see section F.1.
-LAN	- deactivates communication on LAN (Local Area Network).
-1CIRC	- deactivates communication on RcCircuit I.
-MDLL	- deactivates the download function for work stations on RcCircuit I.

D.2 Parameter files

File names: *.CST

In general, the parameter files are described in the user
guide for the control program to which they belong. This
user guide for the RC890-30 control unit describes the CU
parameter files, which are common to the system regardless
of the specific control programs.

In order to simplify the task of customization by text file
editing, the customization parameters are often divided into
groups according to subject and a parameter file is defined
for each group of parameters. A value for a given parameter
must then be specified in the file to which the parameter is
assigned. If a parameter specification is placed in a wrong
file it will have no effect.

Parameter file syntax

In the subsections dealing with the individual parameter
files each parameter specification line is shown in a gen-
eric form which indicates the proper syntax. A general de-
scription of the syntax is given in the following.

    <parameter specification>;<comment>
    ;<comment>

Each line in a parameter file contains the specification of
a parameter and/or a **comment** which is introduced by a semi-
colon (;) - if the line begins with a semicolon, the entire
line is taken as a comment. (Often used in parameter files
when showing examples of parameter specifications).

    <name>,<idenfification>=<value>

A parameter specification always begins with the **name** of the
parameter, which is a sequence of letters (at most 8). In
most parameter files the names are written in capital let-
ters, but small letters will do as well - they are automati-
cally converted to capital letters before acted on by the
CU. The parameter name is often followed by some further
identification, typically in form of an index, allowing for
several similar values of the parameter to be organized in a
table. In such cases the CU applies the relevant value of a
"basic" parameter in accordance with an index number given
by the circumstances of the use of the parameter (the index
number being determined by the link handled, by the second-
ary address served, by the type of malfunction detected ...
and the like). The **value** assignable to a parameter and its
meaning is the subject of the description of the parameters
in the user guides for the control programs in question.

    NAME(,linkno)=0/1/2

In the descriptions of the specification lines, **parentheses**
are used to delimit optional parts - here: (,linkno);
slashes (/) to delimit alternatives - here: 0 1 2; and **words**
or **phrases** to indicate parts whose syntax is explained in
subsequent paragraphs - here: linkno. From the description
the following parts shall be used literally in actual par-
ameter specification lines: **NAME** or **name**, **comma** (,) if not
attributive to an optional part left out, **equals sign** (=)
and **digit** (0 1 2).

Whenever a parameter specification includes a text (char-
acter string), each character following the preceeding de-
limiter (comma or equals sign) is significant, i.e. a char-

acter string may include leading blanks. On the other hand, a numeric parameter value may be preceeded by **blanks, which** in this case have no significance.

```
...=_text        =>  text
...,_4           => 4
```

The generic form of each parameter specification line is shown as the line right below the headline introducing the description of the parameter.

D.2.1 Basic CU system parameters

The basic CU system parameters apply to the functions for
LAN and RcCircuit I communication.

Parameter file

Customization parameters pertaining to basic CU system oper-
ation are specified in the parameter file SYS.CST.

Identification of CU
CUIDENT=nb

CUIDENT   - specifies the control unit as station/ad-
                   dress on the LAN, Local Area Network. The
                   number must be unique for the LAN.

nb   - gives the station number/address, which must
                   be a number in the range 1..99.

        Default : 1

      Exception : If an RC891 / RC39 is connected to the LAN
                  and runs the IBM 3270 communication program,
                  the parameter value 1 must not be used. (Use
                  numbers in the range 2..99).

Number of terminals
NOTERMS=nb

NOTERMS   - specifies the number of work stations with
                   which the CU will communicate on RcCircuit
                   I. A work station whose secondary address is

configured to be equal to or greater than
the value specified will not be able to com-
municate with the CU.

nb   - gives this number, which must be in the
range 1..32.

Default : 32

D.2.2   Download menus

The control unit may serve as a library of terminal programs
for the work stations connected to RcCircuit I.

The menu-based terminal program downloader identifies work
stations by their addresses as secondary stations on the
RcCircuit I. In the configuration of the work stations, it
is the parameter: Address for RcCircuit I - or SA (secondary
address).

The default menus are identical for all work stations; the
menu is shown in figure D.2-1 below.

```
+--------------------------------------------------+
|                                                  |
|        TERMINAL FUNCTION MENU          (1)       |
|                                                  |
|                                                  |
|        Key   Description                (2)      |
|                                                  |
|                                                  |
|        PF1   Terminal configurator               |
|        PF2   RC890 Editor                        |
|        PF3   RC890 SW Install                    |
|        PF4   RC890 CST-File Install              |
|                                                  |
|                                                  |
|                                                  |
|                                                  |
|                                                  |
|     Press function key to select application  (3)|
|                                                  |
+--------------------------------------------------+
```

Figure D.2-1: Common default download menu.
              (n) = Index numbering of FTEXT parameter.

Three texts frame the menu; these "frame texts" appear in
fixed positions on the display, but may be modified using
the FTEXT parameter specification. They will appear identi-
cally on all work stations connected to the CU. The key
names (PF1 in the figure) cannot be modified; they cor-
respond to engravings on the keys of the work station and
are in fact added to the menu at the particular work sta-
tion. Each line centered underneath the two frame lines at
the top represents a terminal program which can be selected
for download.

The CU must know three things, each represented by a charac-
ter string, about a terminal program:

a) A file name whereby the file containing the program to be
   downloaded will be retrieved.

   The file name extension, which is required for complete
   specification of a file, is automatically added in ac-
   cordance with the type of work station connected at the
   particular secondary addresses which use the terminal
   program specification in question. For example, if the
   file name is specified as CONFI the actual name of the
   program file which is downloaded to a secondary address
   with an RC45 work station connected is CONFI.S45 - simi-
   larly, if an RC855 work station is connected, it is
   CONFI.855. Because of the automatic extension, the same
   terminal program specifications may be used by different
   secondary addresses, regardless of the actual type of
   work station. The actual program files (CONFI.S45,
   CONFI.855, ...) must of course be installed on the CU
   system diskette.

b) A description to appear in the menu line representing the
   terminal program, e.g. "Terminal Configurator".

c) (optional) A parameter to be supplied to the terminal
   program subsequent to download, which - in principle -
   enables the emulator function to establish a preselected
   connection to a host computer, by-passing the operator.
   This facility is not utilized by all terminal programs;
   for further information, see the user guide for the ter-
   minal program in question. (Also used by RC855 work sta-
   tions for loading of programs locally).

Parameter file

Customization parameters pertaining to download menus are
specified in the parameter file **MENUDL.CST**.

In the following subsections the parameters are described
and the default (built-in) as well as auxiliary (*.MDL) spe-
cifications are listed. See also section E.

Frame text
FTEXT,ftno=text

FTEXT   - specifies the frame texts of the download
                 menu.

ftno   - index number: 1, 2 or 3, identifying which
                 of the frame texts that is specified. The
                 index numbering relates to the frame texts
                 as indicated in figure D.2-1.

text   - character string with actual frame text (at
                 most 45 characters): (see overleaf).

Default   (also auxiliary DEFAULT.MDL)

FTEXT,1=TERMINAL FUNCTION MENU;   default download menu

FTEXT,2=Key Description

FTEXT,3=Press function key to select application

Auxiliary   (DMENU.MDL)

FTEXT,1=TERMINALFUNKTIONSMENU

FTEXT,2=Tast Beskrivelse

FTEXT,3=Vælg funktion ved tryk på funktionstast

Error text

ETEXT,erno=text

ETEXT   - specifies a text which may occur as a mess-
                 age in the status (bottom) line of the work
                 station in case of an error during download.

erno   - internal error number (1..4) used for trig-
                 gering the assigned message text. The error
                 situations referred to are described in sec-
                 tion F.2.

text   - character string with message text (at most
                 25 characters) assigned to the actual error
                 number:

Default   (also auxiliary DEFAULT.MDL)
               ETEXT,1=CU: diskette error
               ETEXT,2=CU disconnected
               ETEXT,3=Checksum error
               ETEXT,4=CU: program not found

Auxiliary _____ (DMENU.MDL)

            ETEXT,1=CU: diskettefejl

            ETEXT,2=CU: forbindelse afbrudt

            ETEXT,3=Checksumfejl

            ETEXT,4=CU: program findes ikke

Terminal program

TPRG,tpno=fname,desc(,param)

TPRG	- specifies a terminal program which may be referred to in terminal menu specifications (TMENU, see below) by its number, given as tpno.
tpno	- a number in the range 0..25; thus there can be at most 26 terminal program specifications.

Because of the collective way of specification by file name only, more than 26 programs may be retrieved, counting all the work station specific programs (*.S45, *.S16, *.855) individually.

The same terminal program may be used in several specifications, most significantly if the (,param) optional part differs, but also to provide different desc parts. This will reduce the number of retrievable programs.

fname   - the file name of the terminal program, at most 8 characters; always to be written in capital letters. (The appropriate file name extensions are automatically added by the system).

RC855 WS : For a secondary address with an RC855 work
station connected, one can specify the fname
as **A:** in order to load the CP/M operating
system from local disc - further, a program
to be loaded locally may be specified using
the param part (see below).

desc   - the description appearing in the terminal
function menus (at most 25 characters):

Default   (also auxiliary DEFAULT.MDL)

TPRG,0=CONFI,Terminal Configurator
TPRG,1=EDIT,RC890 Editor
TPRG,2=INSTALL,RC890 SW Install
TPRG,3=CSTINST,RC890 CST-File Install

Auxiliary   (DMENU.MDL)

TPRG,0=CONFI,Terminalkonfigurator
TPRG,1=EDIT,RC890 filredigering
TPRG,2=INSTALL,RC890 SW installation
TPRG,3=CSTINST,RC890 CST-fil instal.

(param)   - a optional character string (at most 89
characters) which, if present, will be pas-
sed to the downloaded program.

General : See user guide for the terminal program in
question, regarding the utilization of this
option.

RC855 WS : The file name of a program to be locally
loaded (cf. fname above) may be specified
using capital letters. As an example:

TPRG,7=A:,RcTekst,RCTEKST

Terminal menu
TMENU,secaddr=tpnolist

TMENU   - specifies the menu for a work station whose
                   secondary address is given as secaddr.

secaddr   - a number in the range 0..31.

tpnolist   - a list of terminal program numbers. It must
                   consist of numbers which have appeared in
                   TPRG parameter specification lines prior to
                   the TMENU line. The numbers must be separat-
                   ed by commas.

                   The sequence in which the numbers are listed
                   determines the sequence in which the ter-
                   minal programs appear in the terminal func-
                   tion menu (and thereby which key that is as-
                   signed for selection of the program).

Preselection : A number may be immediately preceeded by **D**
                   to indicate a default terminal program. If a
                   work station is configured for default down-
                   load and its menu contains a default ter-
                   minal program, then no menu is shown when
                   the work station is powered on or reset. In-
                   stead, the default program is loaded without
                   requiring selection by the operator.

        Default   (also auxiliaries DEFAULT.MDL & DMENU.MDL)
                   TMENU, 0=0,1,2,3
                   TMENU, 1=0,1,2,3
                   TMENU, 2=0,1,2,3
                   TMENU, 3=0,1,2,3
                   ...
                   TMENU,31=0,1,2,3

In system administration the tasks are as follows:

o Configuring and customizing the emulation system by edit-
  ing the configuration and customization parameter files.

o Managing the assignment of addresses and device identifi-
  cations involved with the emulator function(s).

o Maintaining a general overview of the installation as
  well as seeing to the day-to-day operation and, possibly,
  taking care of error reporting.

In doing so, this user guide provides information on the
basic issues concerning the control unit: cable connections,
software installation, basic configuration, parameter file
editing, download menu management and normal use, such as
attending start and reset operations and status indicators.

Additional information must be looked up in the user guides
for control programs and terminal programs concerning the
specific issues of a particular emulator function.

CU files

The information on the CU diskette is organized as a number
of named files. The files are of different types: software
modules to be loaded and executed on the CU, program files
for download to work stations, customization files to be
read by the CU during load, and auxiliary files.

All CU files have names of the form "name.ext", where name
consists of at most 8 characters and ext, the file name ex-
tension, is at most 3 characters. The convention for file
naming comes from the CP/M operating system. Files with the
same file name extension are referred to collectively as
"*.ext" files. The form "name.*" is used similarly.

The original CU system diskette contains some basic software items; the actual contents of the CU system diskette depends on the files installed - cf. section C.2.

The CU diskette includes a program, called the RC890 Editor, which may be used to edit and otherwise manipulate the CU files. This program is described in section E.1; see also the subsection: File editing.

Configuration and customization files

These files all carry the file name extension ".CST" - they are described in the user guides for the software modules to which they belong.

The various software modules most often feature built-in default values for all parameters, which are read at start up or reset of the CU; in addition to reading the default values, the *.CST files (if present) are read as well and if a parameter has been specified in the *.CST file, this value takes effect - note from this:

- only changes to default values of parameters in use have to be specified;

- changes only take effect when resetting or starting anew.

With some communication software packages the *.CST files contain equal specifications as the default values; with other packages *.CST files are not included, but have to be created by (editing and) renaming one of the corresponding auxiliary files to be the *.CST file in question.

Auxiliary files

Corresponding to most of the potential *.CST files, one or more "help files" are distributed in addition; these auxiliary files are <u>not</u> read or otherwise accessed by the CU. They are only intended as an aid to the system administrator in that they may be edited and renamed to be the *.CST file in question.

The auxiliary files for a given *.CST parameter file often have the same file name extension, which is derived from the name of the parameter file. In general the correspondence is described in the user guide for the particular control program.

Two auxiliary files are often included for a given parameter file. Both normally contain equal specifications as the default values - however, one of the files provides for the displayable texts in English language (same as the default texts), the other, for texts in Danish language.

File editing

Files on the CU system diskette may be manipulated by editing file names and contents - exchanging CU system diskette and the distribution diskette of a software package during editing, files on the distribution diskette may as well be manipulated. This later aspect may come into consideration during installation of new software releases (as discussed in section C.2). Notably, editing is required during customization.

Files can be edited from an RC work station by means of a program included with the CU basis software, the RC890 editor, as described in section E.1 - or, files can be edited on the RC750 Partner personal computer, using the RC890

file administration program, coming with the Partner ter-
minal programs (cf. appendix H.1), in combination with any
available text editor on the PC.

Editing during customization aims **at:**

CU files
_____

CONFIG.CST   - the configuration file in which the execu-
                  tion of the various functions are invoked.
                  See section D.1 and the user guides for
                  control programs for actual configuration
                  switches.

SYS.CST   - the parameter file which specifies some
                  basic CU system parameters; see section
                  D.2.1.

MENUDL.CST   - the parameter file which controls the down-
                  load of terminal programs to work stations;
                  see section D.2.2.

CP files
_____

*.CST   - the parameter files in which the customized
                  values must be specified in order to take
                  effect over the default specifications.

                  If distributed along with the control pro-
                  gram, they can be edited directly. If not
                  distributed, they may be created based on
                  the auxiliary files, which can be (edited
                  and) renamed to be the parameter file in
                  question.

Beware that having changed any of the parameter specifica-
tions, the CU must be reset before the changes will take ef-
fect. The parameter files are only read by the CU when it is
reset (or started anew).

Management of adresses and device identifications

It is the responsibility of the system administrator to co-ordinate the assignment of addresses and device identifica-tions within a cluster of emulated devices with the custom-ization of the host computer(s). Often fairly rigid rules are applied to the selection of such identifications within the host computer system. It is therefore recommended that cooperation with host computer operating staff be establish-ed as soon as possible when beginning this task.

It is recommended for the system administrator to maintain a list showing the use of each device: physical location, type of terminal, other uses, etc.

As discussed in section B, device identifications are not customized in the parameter files of the CU, but in the va-rious units which emulate the devices. Part of the system administrator responsibilities is therefore as well to as-sign the available identifications to devices and to oversee that they are properly configured in the various units, i.e. work stations and personal computers. Only the device identifications (device numbers) for soft devices which re-side within the CU are part of CU customization, i.e. the customization of the control program to which the soft de-vices belong.

In system management, some additional overall concerns come into consideration, especially when expanding a system - these concerns relate to:

o *Device support of protocol* - the total number of devices
   for a communication protocol in question (e.g. UTS: 62
   logical devices), further the maximum device number
   allowed in a protocol (e.g. IBM: 63 in BSC protocol).
   See: user guide for control programs.

o *Work station support on RcCircuit I* - the total number of
  work stations is 32 at most; in the parameter NOTERMS (in
  file SYS.CST) the number is customizable in the range
  1..32. See: section D.2.1.

o *CU support of simultaneous sessions* - the total number of
  concurrently active devices of all kinds (IBM, UTS, ...)
  on all kinds of connections (LAN, RcCircuit I & II) is
  determined by the Support Level of the CU. See: section
  B.

E.1 RC890 Editor

By means of the program called RC890 Editor (in the follow-
ing referred to as the editor), the system administrator may
manipulate the names and contents of the files on the CU
diskette. The editor may be downloaded to and operated from
a work station.

The function to be performed by the editor is selected from
a menu which is displayed when the editor has been loaded:

```
                    Select function:

            1 Edit
            2 Print
            3 Read file
            4 Write file
            5 Rename file
            6 Delete file
            7 Read catalog
```

General   - the editor is attended as follows:

```
 numeric keys : selects function (1..7)
          ESC : returns from function to menu
   CTRL+CLEAR : returns from editor to work station reload.
```

customization :   the recommended procedure for creating a
                  customized file is to read the corresponding
                  auxiliary file, changing those parameters
                  for which the proposed values are not appro-
                  priate, deleting the remaining (superfluous)
                  parameter specification lines, and writing
                  the file with the applying *.CST name. Note
                  that this overwrites any previous file of
                  that name. As an example:

  read : DEFAULT.MDL
  edit : change and delete as appropriate
 write : MENUDL.CST

           When a file is read, edited, and written
           back with a different name, the original
           file is preserved; in the example, the file
           DEFAULT.MDL remains unchanged.

Edit   - the editor is screen oriented. The screen is
(1)   used as a window which allows the operator
                  to see and manipulate 24 lines of the buffer
                  contents at a time.

Window - when the edit function is selected, the win-
              dow is placed on the first 24 lines, and the
              cursor is set in the first position of the
              first line. The window is moved by moving
              the cursor. The cursor is moved by means of
              the following keys:

     $\hat{}$
     ⌐ : the cursor is moved one line up, without
          changing its position within the line. If
          the cursor was in the first line of the
          window, the window is moved one line back-

ward in the buffer (unless it was at the
beginning of the buffer).

ı
∨ : the cursor is moved one line down, without
changing its position within the line. If
the cursor was in the last line of the
window, the window is moved one line forward
in the buffer (unless it was at the end of
the buffer).

<- : the cursor is moved one position to the
left. If it was already in the first posi-
tion of a line, it is moved to the last po-
sition of the previous line. If the cursor
was in the first position of the first line
in the window, the window is moved one line
backward in the buffer (unless it was at the
beginning of the buffer).

-> : the cursor is moved one position to the
right. If it was already in the last posi-
tion of a line, it is moved to the first po-
sition of the next line. If the cursor was
in the last position of the last line in the
window, the window is moved one line forward
in the buffer (unless it was at the end of
the buffer).

↵ : the cursor is moved to the first position of
the next line. If it was in the last line of
the window, the window is moved one line
forward in the buffer (unless it was at the
end of the buffer). In insert mode (see be-
low), this key causes a new line to be en-
tered in the buffer.

->| : the window is moved 24 lines (or as much as
          possible) forward in the buffer. The cursor
          is not moved.

|<- : the window is moved 24 lines (or as much as
          possible) backward in the buffer. The cursor
          is not moved.

   ⌐\ : the window is placed in its initial posi-
          tion, i.e. on the first 24 lines of the buf-
          fer, and the cursor is set in the first po-
          sition of the first line.

Update/ - the contents of the buffer are modified by
Insert   keying in alphanumeric characters. In update
mode   mode existing data at the cursor position is
            overwritten; in insert mode it is "pushed
            ahead". Initially, the editor is in update
            mode.

          Engravings on the keys used in update/insert
          mode are sligthly different according to the
          work station used (RC45 or RC855).
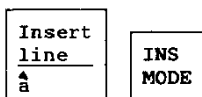
```
┌─────────┐ ┌──────┐
│ Insert  │ │ INS  │
│ line    │ │ MODE │
│ ▲       │ │      │
│ a       │ │      │
└─────────┘ └──────┘
```
  RC45   RC855

   : to change mode, press the key. Indicator is
          lit when in insert mode.

          Additional insertion and deletion functions
          are obtained by means of the following keys:
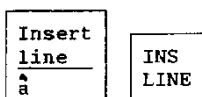
Shift +
```
┌─────────┐ ┌──────┐
│ Insert  │ │ INS  │
│ line    │ │ LINE │
│ ▲       │ │      │
│ a       │ │      │
└─────────┘ └──────┘
```
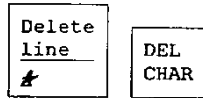 RC45   RC855

   : a line is inserted before the line in which
          the cursor is positioned. The cursor is

moved to the first position on the new line. (RC45: hold the Shift key pressed down while pressing the key).

```
┌──────────┐  ┌──────────┐
│ Delete   │  │ DEL      │
│ line     │  │ CHAR     │
│ ⌁        │  │          │
└──────────┘  └──────────┘
```
  RC45   RC855

: the character at which the cursor is positioned is deleted. The rest of the line is moved one position to the left.

Shift +
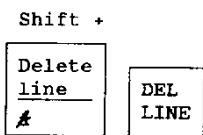
```
┌──────────┐  ┌──────────┐
│ Delete   │  │ DEL      │
│ line     │  │ LINE     │
│ ⌁        │  │          │
└──────────┘  └──────────┘
```
  RC45   RC855

: the characters from the cursor position to last position in the line are deleted. A whole line is deleted when the cursor is positioned at the first position of the line. (RC45: hold the Shift key pressed down while pressing the key).

Print   - the function is used for obtaining a printed
(2)   hardcopy of the contents of the buffer. The printer must be (physically) attached to the work station on which the editor is executed. It is recommended that a printed copy be kept of all customization files that contain changes from default values.

Read file - will request the name of a file which is
(3)   then read into the buffer, destroying any previous contents of the buffer. The contents of the buffer may subsequently be edited if function 1, Edit, is selected.

Write file   - the buffer contents are written to a file
(4)   by means of this function, which also re-
                 quests a file name. The editor always asks
                 for confirmation before writing a file, as
                 writing destroys any previous contents of
                 the named file.

          ⏎ : giving no file name, but pressing this key
                 instead, the name of the last file read is
                 assumed.

Rename file   - this function may be used, if only renaming
(5)   with no editing is desired. Note that renam-
                 ing does not preserve the original file.

Delete file   - this function is used for deletion of a **file**
(6)   on the CU diskette.

Read catalog   - this function is used for displaying the
(7)   names of all CU files.

During normal use, when work stations or personal computers
are used to emulate devices in cooperation with the CU, the
CU will not be directly visible to the user; the functions
of the CU appears as functions of the WS or PC. In general,
the information needed by users of the terminal devices is
found in the user guides for the relevant terminal programs
and not in this guide.

In every-day operation of the emulation system, the system
administrator just has to take care of the start of the CU
and kep track of the system status. The general tasks in CU
operation are further discussed in section F.1 below.

The CU system, however, also has a monitoring function: it
discovers when errors or abnormal situations arise in the
various types of communication it supports. In these in-
stances text messages issued by the CU will be shown on the
relevant terminal display. See description in section F.2.

F.1 Operating guide

In general the control unit is attended as follows (see also
illustration overleaf of CU front and rear to which the sub-
scripts refer):

Power switch$_1$ - located on the front panel of the CU. Built-
                    in indicator lamp (red) is lit when power is
                    switched on.

       Selftest : The CU performs a selftest immediately upon
                    power on (or reset); see also Indicator
                    lamps below.

Reset$_2$ - the RESET press-button is located at the
                    rear panel of the CU.

CU rear

2

RESET ●

CIRC

J11
J10

J6
J7
J8
J9

K1
(MS)
220 – 240V
50 Hz ~
200 W

J1 J2 J3 J4 J5

L
A
N

CU front

1

3

STATUS
1 2 3 4

RETRY
ERROR
TEST
READY

Not drawn to scale
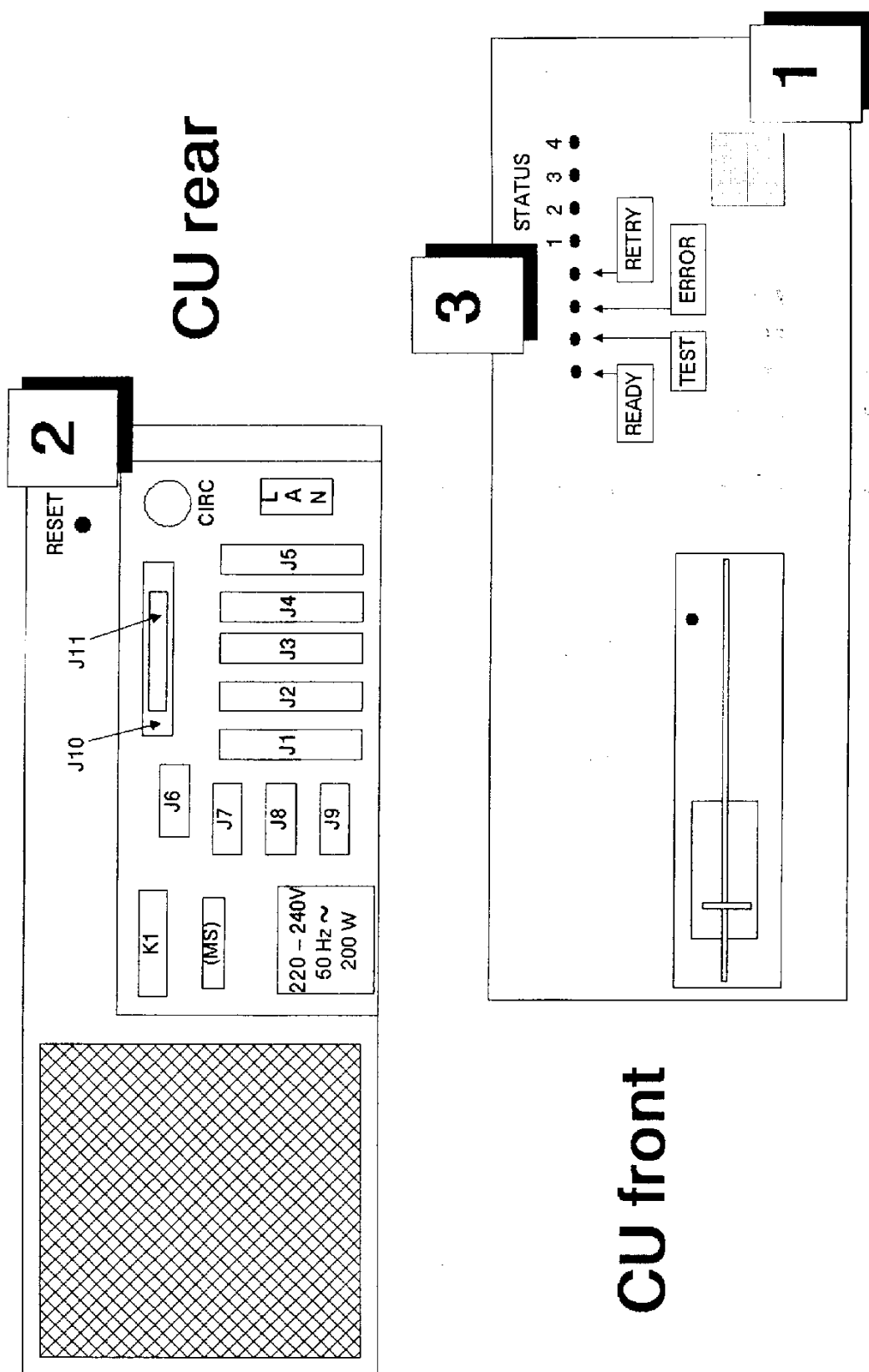
Pressing the **RESET** button causes the CU to
start anew, as if power was switched (off
and) on.

Indicator   - a row of eight small lamps is visible on the
lamps$_3$ front panel of the CU cabinet; they are used
              for indication of the operational status as
(● = lit)   follows (see also section C.2):

READY TEST ERROR

_____

During selftest _____

O	●	O	Lit while in advance
●	●	O	Remains lit due to abnormal termination
O	●	●	Lit on detection of error

During initial load phase _____

●	●	O	Lit while in advance
O	●	●	Lit on detection of an error (could be due to a missing CU system diskette)

During normal operation _____

●	O	O	Lit during normal operation
O	O	●	Lit on detection of an error

During normal operation, activities may be
indicated as follows:

RETRY   STATUS
       1 2 3 4

_____

Activity on connector: _____

(●)	O	●	O	O	CIRCUIT; when lit, RETRY indicates retransmission on the connection.
	●	O	O	O	LAN (Local Area Network); operable only, if the RcCircuit I comm. control. option is installed, too.

Note : The status lamps are not used during normal
       operation in all cases; for specific infor-
       mation, see the user guide for the control
       programs.

Errors : In all cases when the ERROR lamp lights, a
       note should be made of which other lamps are
       lit and which not, as this information may
       be of importance in an error report. Subse-
       quently, the CU may be reset in order to re-
       start. Except for the case where the error
       occurred during selftest, useful information
       on the error may also be obtained from the
       CU log file, i.e. ERRORLOG.BAK, after the CU
       has been restarted. See subsection, CU log
       file, below.

Installation - as described in section C; in normal use
       check accordingly, especially if malfunc-
       tions should occur. For specific use of **the**
       cable connections, check with the user
       guides for the control programs.

Configuration - as described in section D & E. For specific
Customization   parameter file descriptions, check with the
       user guides for the control programs and,
       regarding aspects in device configuration,
       with the user guides for the terminal pro-
       grams.

Beware : When the configuration or parameter files
       have been changed, the CU must be reset
       before the changes will take effect. The
       configuration and parameter files are only
       read by the CU when it is reset.

Errors : See CU log file below.

CU log file

The CU logs certain types of information in a log file. This happens when the configuration and customization files are read, during load of software modules, and when errors are detected while the CU is in operation.

In general, the information in the system log is intended for RC software maintenance staff and not for the user. It may, however, be useful to read the log if the customization parameters prepared in the *.CST files by the system administrator do not have the intended effect.

When a parameter specification line in one of the files is not acceptable to the CU, either because of a syntax error, or because the parameter does not apply to the configuration as specified in the CONFIG.CST file, a line is written in the log file. This line will contain the name of the parameter file and the parameter name found at the beginning of the rejected line. All information about rejected parameter specification lines will appear in the first lines of the log. The system administrator may therefore read the beginning of the log as a report on the acceptability of the attempted customization.

Whether or not the system administrator considers it useful to read the log, it is recommended practice to print out the file in case of a malfunction attributable to the CU. This can be done by means of the RC890 Editor (cf. section E.1). Such a printout should be submitted with any error report concerning a CU function.

File name: **ERRORLOG**   - if retrieved before restart of CU
                            or by means of another diskette
                            drive (e.g. on another CU).

          ERRORLOG.BAK - if retrieved upon restart of CU.

If the configuration switch INFO (in file CONFIG.CST) is in-
cluded, the CU log file will contain additional information
(addresses and the like) compared to the usual log file. The
system administrator may be asked by RC personnel to include
this switch, if not present already, in order to obtain ad-
ditional information in support of trouble shooting.

F.2 Displayable text messages

As stated earlier, the CU system has a monitoring function:
it discovers when errors or abnormal situations arise in the
various types of communication it supports. In these in-
stances text messages issued by the CU will be shown on the
display for the relevant terminal device.

The term error is used here not to indicate a fault on the
part of the CU, but rather in the external part of the sys-
tem or in the configuration and customization of the system
as set up by the user (system administrator).

In general, these messages originate from the control pro-
grams executed on the control unit and they are discussed in
the user guides for the control programs - a discussion
which considers the situations implied by the messages, the
default texts and the possibilities in customization.

Also in the user guides for the terminal programs, a de-
scription of the relevant messages, their meaning and poss-
ible remedies, is found, because it is on the particular
work station or PC that the messages appear.

Error messages during download

All the messages discussed may be customized (in the file
MENUDL.CST), i.e. modified according to user taste or pre-
ference, e.g. translated to a different language (cf. sec-
tion D & E).

In the following the default versions of the messages are
shown with an indication, given in parentheses, of the par-
ameter name and text number to be used when customizing a
replacement text. The maximum number of characters is indi-
cated by shadowing.

CU: diskette error   (ETEXT,1)

An error occurred when the CU tried to read a program file
from its diskette. The reason could be that the diskette had
been removed. It could also be a malfunctioning drive or an
unreadable spot on the diskette. A couple of retries should
be attempted before the error is reported.

CU: program not found   (ETEXT,4)

The CU accessed its diskette correctly, but only to find
that the selected program file did not exist. The relation-
ship between selection lines in the download menu and file
names is explained in section D.2.2, Download menus.

The most obvious reason for a program file to be missing is
that it has not been installed. Terminal programs are di-
stributed in separate packages which must be installed be-
fore the programs can be loaded.

CU disconnected   (ETEXT,2)

The connection between the CU and the work station was bro-
ken. A couple of retries should be attempted before the er-
ror is reported, since the problem may be only temporary,
e.g. when the CU is reset.

A program file is downloaded as a number of data messages
(blocks). Each data message is protected during transmission
on the RcCircuit (I) by a cyclic redundancy check and re-
transmitted in case of error. An excessive number of re-
transmissions, which may occur if the cable is in very poor
condition or poorly connected, causes the CU connection to
be broken.

The connection is also broken, as observed from the work station, if the CU ceases to operate (cf. section F.1, Indicator lamps).

Note that this message will not appear if the connection has not been established at all, e.g. if no physical connection (RcCircuit) exists.

Checksum error   (ETEXT,3)

An error was detected when a checksum was computed on the complete program after all blocks had been transferred to the work station. This message therefore does not indicate a transmission problem. The reason may be that a bad program file was read from the CU diskette, or a RAM error within the work station. Some prelease program files may not be furnished with a checksum at all, in which case the message has no significance. In spite of the checksum error, the downloaded program will be started in the work station.

This main section contains various information beyond the
scope of the other main sections.

Maintenance

See to maintain a clean and well-conditioned environment as
discussed in section C.1. In addition take care of the fol-
lowing as needed:

o *Fan dust filter* - should be cleaned at regular intervals;
   the filter is made of foam-rubber, which covers the air
   inlet of the fan, and is removable when squeezing it.
   Clean by tapping against a hard surface. DO NOT use any
   liquid cleaner as this may clog the filter.

o *Fuse* - the fuse container is located at the CU rear. A
   blown fuse is replaced as follows: switch off power and
   unscrew fuse cap, replace fuse by spare of specifications
   φ5x20 mm 1.6 Amp SB (slow blow), recap container. DO NOT
   replace a fuse more than once at one occasion.

System monitoring

See user guides for control programs and terminal **programs**
for the availability of displayable statistics.

Special operating procedures

Upon failure of ordinary procedures, some special procedures
may be invoked in the course of trouble shooting. These pro-
cedures are most often supervised by RC system consultants
on location or by telephone.

Configuration

If a system cannot be loaded (expected to be due to con-
figuration error) and the CU is hung up as result, the mode
selector (CU rear - see section C.1) may be set to position
1 and the CU started anew. This will force the system moni-
tor to load all modules possible, enabling a new configur-
ation to be set up. The mode selector must afterwards be
reset to postion 0 (normal use) and the CU re-started the
usual way.

Start-up

The system may be started from a console, which enables the
CU hardware configuration and the CU log information to be
displayed on the screen. Proceed as follows:

1) Connect an asynchroneous terminal to the connector marked
   K 1 at the CU rear, using either of the cables marked:
   KBL912/13/14, KBL561 or CBL447.

2) Set the terminal to the transmission specifications:
   (<=)9600 bps, 8-bit char, 1 stop bit, no parity;

3) Power on - or restart - the usual way.

4) Receiving a string of * (asteriks), type a capital U
   (Shift + u), thereby the selftest starts.

   (If the transmission speed is less than 9600 bps, another
   character than the asterisk will be received - this makes
   no difference in the procedure).

5) On completion of the selftest, the CU hardware configur-
   ation is displayed on the console screen, followed by an
   * (asteriks) on one of the next lines.

6) To proceed with normal operation from this point, type lg (or LG) - for load and go.

The CU log file information is displayed on the console screen. Having included the configuration switch INFO (in the file CONFIG.CST), the information will contain addresses and other information not shown by the normal CU log file.

This main section contains appendices.

H.1   References

*   - user guide is included with software package;
     additional copies obtainable by stated order number

** - user guide is not included with software package;
     copies obtainable by stated order number

IBM communication

RC890-30 control unit,
- control program SW8931
- user guide*, English SW8931-D

RC45 work station,
- terminal program SW8931
- user guide**,
    - English SW8914I-D
    - Danish SW8914-D

RC855 work station,
- terminal program SW8931
- user guide**,
    - English SDO077
    - Danish SDO085

RC750 Partner personal computer,
- terminal program,
    - English SW1630
    - Danish SW1530
- user guide*,
    - English SW1630D
    - Danish SW1530D

*
  - user guide is included with software package,
    additional copies obtainable by stated order number

**
  - user guide is not included with software package,
    copies obtainable by stated order number

UTS communication

RC890-30 control unit,

  - control program SW8933
  - user guide[*], English SW8933-D

RC45 work station,

  - terminal program SW8933
  - user guide^{**},

     - English SW4504I-D
     - Danish SW4504-D

RC750 Partner personal computer,

  - terminal program SW1555
  - user guide[*], Danish SW1555D

H.2   Connector interface standards

The connectors used to mount the signal cables for external communications are located on the back panel of the RC890-30 cabinet as described in section C.1.

Connectors J1..J5

Standard 25-pin D-connectors are used with pin assignments allowing the same connector to be used for either V.24 or X.21 connections by means of different cables.

Pin 11 is used to distinguish a cable intended for a V.24 interface from one intended for X.21. The signal should be:

```
  ON for V.24
 OFF for X.21    ;pin 11 receives an internal signal by short
                 ;cut to pin 7.
```

V.24 interface
The correspondence between connector pins and those V.24 interface circuits which are used complies with ISO standard 2110 as shown below:

Pin no.	V.24 interface circuit
1	protective ground
2	transmitted data (103)
3	received data (104)
4	request to send (105)
5	ready for sending (106)
6	data set ready (107)
7	signal ground (102)
8	carrier (109)
15	transmit clock (114)
17	receive clock (115)
20	data terminal ready (108/2)

X.21 interface

The X.21 interface circuits are assigned to the pins not
used for V.24 signals as shown below:

Pin no.	X.21 interface circuit
1	protective ground
7	signal ground (G)
9	transmit (T) A
10	indication (I) A
12	transmit (T) B
14	control (C) B
16	signal element timing (S) B
18	signal element timing (S) A
19	receive (R) B
21	receive (R) A
24	indication (I) B
25	control (C) A

Connectors J6..J9

Standard 9-pin D-connectors are used with pin assignments as
follows:

Pin no.	V.24 interface circuit
1	carrier detect (109)
2	received data (104)
3	transmited data (103)
4	data terminal ready (108/2)
5	signal ground (102)
6	data set ready (107)
7	request to send (105)
8	clear to send (106)
9	ring indicator (125)

The assignment of connector pins to the V.24 interface cir-
cuits which are used complies with the specifications of an
IBM PC/AT communications adapter.

RETURN LETTER

Title: RC890-30 Control Unit, User Guide

RCSL No.: 991 10790

A/S Regnecentralen af 1979/RC Computer A/S maintains a continual effort to improve the quality and usefulness of its publications. To do this effectively we need user feedback, your critical evaluation of this manual.

Please comment on this manual's completeness, accuracy, organization, usability, and readability:

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Do you find errors in this manual? If so, specify by page.

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How can this manual be improved?

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Company: _____

Address: _____

Date: _____

Thank you

.... **Fold here** ....

.... Do not tear - Fold here and staple ....

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                    af 1979

Information Department
Lautrupbjerg 1
DK-2750 Ballerup
Denmark