```
                     README.TXT

            Release Notes for EPSON RC+
                Version 3.4.1 SP 4

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Installation Notes
==================
1. EPSON RC+ must be installed on Windows NT 4.0.

    NT 4.0 Service Pack 4, 5, or 6 must also be installed.

    Windows 2000 will be supported in a future release.

2. SeikoRCS users: Please refer to the upgrade notes
    found later in this file.

3. You must be logged in as Administrator to install.

4. To install:
    a. Insert the EPSON RC+ installation CD.
    b. The setup program will start automatically.
    c. If setup doesn't start, run e:\EpsonRC\setup.exe
       where e: is the CD drive.
    d. Follow the instructions on the screen.

5. When you reboot the system for the first time after
    installation, you must use the same login name that
    you used for installation. This is so that system
    files are updated properly.

6. In order run SPEL programs, you must install the
    SPEL Runtime Drivers. This is specified during installation.

7. To use EPSON RC+ on a PC that will not be running
    a robot, such as a laptop, do not install the SPEL Runtime
    Drivers option.

8. To use Vision Guide without a frame grabber, select VGA mode.

9. You can install EPSON RC+ on the same system
    where SPEL for Windows v1.xx or v2.xx is installed.
    The EPSON RC+ installation creates a new Windows program
    group and no files are shared with v1.xx or v2.xx versions.

10. When using the VB Guide option, you must install
    Visual Studio 6.0 Service Pack 4 or greater.

Getting Started
===============
After installation, there will be a program group called

"EPSON RC+". A desktop shortcut is also created.

To start EPSON RC+, either double click the desktop shortcut
or click Start, then select EPSON RC+ from the
EPSON RC+ program group.

The very first time you run EPSON RC+, no projects will be
open. You must create a new project by selecting New Project from
the Project menu. By default, the next time you run EPSON RC+,
the last project you were working on will be opened automatically.

Getting Help
============
EPSON RC+ has context sensitive help. Press the F1 key
at any time to get help for the current operation, or click on
the HELP button for the current dialog box, if available.
You can get help for SPEL+ language keywords in the Edit window by
placing the insertion point anywhere within a keyword and pressing
the F1 key.

You can also select Contents from the Help menu to open the Help
table of contents. First time users should review the
Introduction in the help contents.

Upgrade Notes
=============
EPSON RC+ Users:

1. You may install a newer version of EPSON RC+ without
   uninstalling the previous version. This is recommended
   because the upgrade software will know which options were
   previously installed and your system configuration will
   be preserved.

2. Execute MKVER before upgrading to save your system configuration.
   Select Tools | Maintenance, then click MKVER. Enter a name and
   save it to floppy. If you decide to uninstall the previous
   version of EPSON RC+, the robot setup information will be removed.
   After installing the new version, you can use SETVER from
   Tools | Maintenance to restore the system configuration.

3. Before you start installing the new version, ensure that the
   SPEL Runtime Drivers are shutdown. If you see the robot icon
   in your Windows system tray, then right click on the icon and
   select Shutdown SPEL Drivers. If you attempt to install when
   the drivers are running, you will receive a message to shutdown
   the drivers before you can proceed. In this case, you will
   have to start the setup program again by re-inserting the CD
   or double clicking on the CD icon in My Computer.

SeikoRCS Users:

1. The Seiko Instruments USA Factory Automation Robotics Division
   has been acquired by SEIKO EPSON CORPORATION and Epson America, Inc.

The SeikoRCS product is now EPSON RC+.

2. To upgrade from SeikoRCS to EPSON RC+:
   a. Start SeikoRCS.
   b. Execute MKVER from Tools | Maintenance.
   c. Uninstall SeikoRCS from Control Panel | Add/Remove Programs.
   d. Reboot the system.
   e. Install EPSON RC+.
   f. Execute SETVER from Tools | Maintenance.
   g. Set your preferences from Setup | Preferences.

3. One of the most important features of EPSON RC+ is
   complete ANSI/RIA 15.06-1999 support. You are encouraged to
   upgrade your systems to use EPSON RC+. Of course, as with
   all upgrades, you should test the upgrade on one cell first
   (offline, if possible) and check operation before committing
   to production. When you open a SeikoRCS project, it will be
   copied into the EPSON RC+ directory. The original project
   will be left unchanged.

Release Notes v3.4.1
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1. If you are using TCP/IP, you will have to change your
   code by adding the Server | Client parameter to
   all OpenNet statements. If you do not add this
   parameter, the compile will fail.

   It is strongly recommended that all systems using
   TCP/IP to communicate with each other be upgraded
   to version 3.4.x. Avoid mixing with previous versions.

2. When using the force sensing option, make sure that you
   always match the serial number on the sensor with the
   serial number on the PC board. The calibration data for
   each sensor is stored on the corresponding PC board.

3. When using 1/2 and 3/4 video scaling, you may notice
   video tearing when the camera subject is moving. This
   does not affect vision searching. All vision searches
   are performed in a full scale off screen buffer. That
   buffer is then scaled in software for display.

Revision List v3.4.1 SP4
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What's Fixed in v3.4.1 SP4:
1. Fixed local variable problems when tasks were being
   Quit and no abort occurred. Sometimes local variable
   values could be changed after making a function call.
   This was more likely to happen when SPEL+ tasks are
   started from VB Guide.

2. Fixed problem with error 419. Previously, if one task
   was waiting to execute certain commands (including vision)
   and several other tasks were also executing these

commands, then after 3 seconds error 419 could occur.

3. Fixed overflow error for Vision Guide Edge tool.
   If an edge was found, and then not found for a few
   hundred cycles, an overflow error could occur. This
   exact not found count depends on the score when found.

4. FmtStr no longer appends a CRLF at the end of the formatted string.

Revision List v3.4.1 SP3
========================
What's Fixed in v3.4.1 SP3:

1. Fixed remote outputs for current robot. When the
   current robot is changed via remote inputs, the remote
   outputs related to robot status were not being updated.

2. Fixed Wait when used with the following functions:
   In, InW, Out, OutW, Ctr, Lof, Motor, MCalComplete

   SPEL+ was not waiting for the expression to become true
   when these functions were used in a Wait statement.

3. Fixed text cursor for Vision Guide sequence and object
   properties. If you clicked on a result value, then
   clicked on a property that contains text, the text
   cursor (caret) did not appear.

Revision List v3.4.1 SP2
========================
What's Fixed in v3.4.1 SP2:
1. Fixed problem for quick pause. If QP OFF is executed
   in a program and QP ON is exected later, Pause
   did not work correclty.

2. Fixed error 4242 when safeguard was opened during
   Pass and Cont was executed.

3. Fixed crash condition that can occur when
   EXIT FUNCTION is used in a single line IF statement.
   For example:
       If a = 1 Then Exit Function

   In rare cases, this could cause RC+ to crash.

4. Fixed problem for Vision Guide calibration.
   In the Calibration dialog, only 4 cameras were
   allowed for Meteor2 frame grabber. This has been
   fixed to allow 12 cameras for Meteor2.

Revision List v3.4.1 SP1
========================
What's Fixed in v3.4.1 SP1:

1. The ES653S robot model can now be added.

2. Error 4103 was fixed when jogging to teach calibration
   points from Vision Guide.

3. The I/O type column was fixed for the I/O Label Editor
   when used with Ethernet I/O.

4. Fixed video update when strobe is used.

5. Fixed remote outputs for current robot.

6. Fixed problem for Error statement. If Error was used
   in a function without error handler, then variables
   in the calling function had incorrect values.

7. Fixed local variable initialization problem. If a program
   was aborted, then run again, the local variables in the
   aborted function were not being initialized.

8. Fixed error 76 when Setup | System Configuration was selected
   and Vision Guide was installed in VGA mode.

Revision List v3.4.1
====================
What's Fixed in v3.4.1:

1. Default points are now loaded after switching group using
   remote inputs.

2. First Print statement can now be seen on the Operator Window
   after starting a program using remote input.

3. Hofs and MCOfs can now use 8 digits from the Robot Configuration
   dialog.

4. Fixed auto start from Operator Window if mode was switched to
   Program / Debug during start up. Now auto start is correctly
   disabled in Program / Debug mode.

5. Fixed step through Restart and Chain statements.

6. Newly added point files are now displayed in the Jog & Teach
   dialog point file drop down.

7. Fixed problem with For...Next when used in a GoSub routine.

8. Fixed problem where sometimes the label for P0 was being deleted
   when switching point files from Jog & Teach.

9. CtrlDev function now returns correct values.

10. RobotModel$ and RobotType functions now work without the RobotNumber

parameter when used in an expression. In previous versions, you had to
    always use the RobotNumber argument.

11. Fixed Run Window title when CtrlDev is remote.

12. You can no longer change the group on the Run window when
    tasks are running.

13. The Point number column is now displayed correct when opening
    the I/O label editor for Ethernet I/O.

14. Fixed ByRef variables when used on right side of statement
    inside a function other than the main function.

15. Fixed memory access violation errors that sometimes occurred
    with ParseStr or Redim string.

16. Fixed variable display using mouse hover for function parameters.

17. Fixed password for Administrator in Security option. It was
    not functioning.

18. Fixed TCPIP_PortNumber parameter for SetNet. Now an expression
    can be used.

19. Fixed problem for Jog and Teach and P* when safeguard is open.
    Now when safeguard is open, robot XYZU coordinates are updated
    correctly and the Teach button for Jog and Teach and P* in user
    programs now works correctly.

20. Fixed Homeset GUI. If Homeset was not defined, and you view
    the Homeset tab from Projects | Robot Parameters and click OK,
    then the Homeset values were changed to -999999999. Now
    they are not changed.

21. Fixed Strobe for Vision Guide. At run time, the vision system
    was not waiting for the strobe input to occur. For the
    Vision Guide GUI, the graphics were not displayed if
    the sequence was aborted before the strobe input fired.
    Also, the Step button did not work correctly.

22. Fixed compile error for point statement with negative
    number for U axis and point attribute is specified.
    For example: P1 = 1, 2, 3, -4 /L

23. Fixed video update problem for Run window when Vision Guide
    window was also open.

Revision List v3.4.0
====================
What's New in v3.4.0:

1. Support for ANSI/RIA 15.06-1999 has been added.

Robot motors will now turn off when the safeguard is open.
Attend Mode has been added to allow jogging and slow
motion with the safeguard open while holding a dead man
three position enable switch. Refer to the Safety chapter
in the EPSON RC+ User's Guide for more information.

2. Now the default installation drive is D, if it is available.
   When configured at the factory, drive D is used for
   EPSON RC+ because it is formatted as an NTFS drive,
   which is more reliable. It is recommended that you
   always install on drive D when not using EPSON RC+
   off line.

3. I/O labels can now be used in expressions. This allows
   you to pass a label to a function or use it in an integer
   expression.

4. During stepping through code, if the step line is
   the last line in the window, the step line is
   centered in the window.

5. Now there is a message box stating when a Find has been
   completed, instead of wrapping around to the first
   search result.

6. The OCR object Character Constraints dialog was improved.
   Now the font characters are displayed and can be copied
   and pasted into the constraint column.

7. A pop up menu has been added to the Jog and Teach dialog
   for Free Axes. If you right click anywhere in the
   Free Axes group, a menu is displayed to Free All or
   Lock All.

8. Improved connection time for OpenNet. A new parameter
   has been added to specify Server or Client.

9. Added new operation modes:
      Production / Debug
      Production / Operator
      Production / Remote

   See the on line help for details.

10. Added status bar to Operator Window to show emergency stop,
    safe guard, and date/time.

11. Added the following remote outputs:
    AtHome: This output is only on when the robot is at
               the home position.

      EnableOn: This output is on when the dead man switch
                 is engaged during attend mode.

MotorMode: Current user motor mode setting.

PowerMode: Current user power mode setting.

See on line help for details.

12. Now remote input and output names can be used in I/O status
    functions Sw and Oport. For example:
    If Sw(AtHome) = Off Then
          Home
      EndIf

13. Now the Run Window function list displays function names
    in sorted order after the main function.

What's Fixed in v3.4.0:

1. Fixed CX, CY, CZ, CU, POrient, and PLocal when used
   with P(expr) or Pnumber.

2. Added EStop and Safety status to the main window
   status bar.

3. Added new SPEL+ function called JT. JT returns the
   status of the last Jump command for the current robot.
   See help for details.

4. Fixed import for user errors. User errors could not be
   imported from other projects.

5. Fixed font change for editor. If monitor window was open
   when editor font was changed, the monitor window used
   the editor font until the next session.

6. Fixed the RTS/CTS check box for Comm Ports configuration
   in Setup | System Configuration | Comm Ports.

7. Fixed vision graphics when OCR tool is in use. Sometimes
   when stepping through a sequence, some objects were
   being drawn with dotted lines instead of solid lines.

8. If a comment included two or more apostrophes, then
   during debug stepping, the debugger would step through
   the line containing the comment.

9. The vision Correlation object no longer moves to it's
   CenterPointObject position during teach.

10. If User Errors are changed, the event is now logged
    in security audit database.

11. Fixed User Errors. If a label was removed, the project
    programs were not being recompiled.

12. Fixed OCR frame problem. If an OCR object was in a frame
    and the frame step was changed because an object with
    a lower step number was deleted, a type mismatch error
    was occurring when the sequence was run.

13. Fixed problem for Correlation object. After starting
    a session, the search parameters were set internally
    to the values at teach time.

14. Fixed Display Variables dialog for local strings.
    When the string value was changed, the new value was
    not being retained.

15. Fixed bad identifier error when using mixed data types
    with Input. For example, the following statement was
    causing an error: Input a, b$

16. User function names can no longer have the same name
    as a DLL function name. Now an error will occur.

17. Fixed problem for point labels that were maximum length
    (16 characters). In 3.3.0, internal errors were occurring
    during point file save or project build. In previous
    versions, point labels with 16 characters were causing
    memory corruption.

18. Fixed line numbers when errors are reported and program
    has been numbered.

19. Fixed bug for CameraBrightness and CameraContrast properties.
    They were not being loaded when a new session of EPSON RC+
    was started. This only affects vision systems with
    Meteor2 frame grabbers.

20. Fixed error 231, 'MCAL has not been completed' during VRun at
    runtime if robot is not robot 1 and MCAL is executed at runtime.

21. Fixed PDef function so it handles point labels and Pxxx.

22. Fixed Point object when used with Frame. If the point location
    is not in the video image, it is considered not found.

23. Fixed VGet when some arguments are an array variable but the
    last argument is not. Error 416, "Not an array", was occurring.

24. Fixed problems for nested #ifdef statements.

25. Fixed XYLim, Local functions. These functions return a point.
       p1 = XYLim(1)
       p2 = Local(1)

26. Fixed TlSet when used with a point.
    TlSet 1, p1

27. Fixed macros that defined multi-statements when defined
    in an include file.
       #define PRN_DATA(a, b) Print "Data a = ", a; Print "Data b =", b

28. Fixed build problem for include files. If an include file had a
    statement with a syntax error, then the compiler would not
    catch it.

29. Fixed For...Next problems:
    A. When Exit For or Exit Function was used to abort a loop in
       a called function from another For...Next, the loop would
       not terminate.

    B. If the For...Next variable value was already outside the range
       of the loop, the loop was executing one time. Now it does not.

30. Fixed single line If problem when multi-statements are used.
    Multi-statements were not all attached to the if condition.
    For example, in the following code, b was printed, even though
    the If condition was false.

    a = 0
    If a = 1 Then b = 2; Print b

    Now all multi-statements on a single line If statement are only
    executed when the If condition is true.

31. An expression can now be used in the Pallet function for the
    palletNumber parameter.
    For example:
    P1 = Pallet(a + 1, 1, 1)

32. Improved Select TRUE for certain Case statements to be more
    compatible with the SPEL language used on SRC-3** controllers.
    Since TRUE is -1 in SPEL+, but 1 in SPEL, the following
    statements were not executing properly, because Sw(xxx)
    or Oport(xxx) evaluate to On (1) or Off (0), instead of -1 or 0.
    Now this code will work in SPEL+, too.

```
  Select TRUE
     Case Sw(1)
       Print "case 1 is true"
     Case Sw(1) And Sw($2)
       Print "case 2 is true"
     Case Oport(3)
       Print "case 3 is true"
  Send
```

    However, we recommend adding a Boolean expression to make
    it read more clearly:

```
  Select TRUE
     Case Sw(1) = On
        Print "case 1 is true"
```

```
        Case Sw(1) = On And Sw($2) = On
          Print "case 2 is true"
        Case Oport(3) = On
          Print "case 3 is true"
    Send
```

33. Fixed problem for robot point file on Jog & Teach after
    changing the current robot outside of Jog & Teach. The
    wrong point files were shown in the Point File drop
    down list.