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Subject: PG3 SWERs and Changes Between V2.0 and V2.1
Doc #: EB-EPG3-021 Rev.7 (V2.1)

For Action	For Information	For Circulation
Jean Tremblay 432		

$200-$20A

SWER	Program	Description/Action Taken
855	SPROM	**DONE** a) The starter package can now create Hex files. b) Corrected checksum of Tektronix format hex record.
856	SASM	**NO PROBLEM EXISTS** This is OK. To use the FB parameter 10 with ADD you must define the FB parameter as type K, e.g. =2 K, and use K 10 in the FB call, ADD requires the K. For LDL, the FB parameter is a 16-bit value, defined with 'W', e.g. .=2 W. To use both, you must define two FB parameters, one as type K and one as type w. Tech note: This is a firmware limitation, the firmware does not allow 'K' type FB parameters to be used with LDL, LDH etc, because K values have the medium control code (for K) in the upper 3 bits of the parameter, and if used as a 16-bit value the number is invalid. E.g. K 10 = 1000 0000 0000 1011 binary (800A hex) which is 32778 decimal.

857	SASM	**NO PROBLEM EXISTS**
		.SRC is the default extension for $include file names, and it is appended if no extension is given. For $include files without an extension, end the filename with a '.', this is the DOS standard. The help texts have been updated to make this clearer.
		`e.g. $INCLUDE SYMBOL.  ;includes file SYMBOL`
		`     $INCLUDE SYMBOL   ;includes file SYMBOL.SRC`

858	SBUG	**NO PROBLEM EXISTS** Connecting the cable to another PCD while SBUG is running: In order to register the connection to a new PCD, it must first go off-line, otherwise SBUG still thinks it's connected to the same PCD, and still uses the original PCD's header and other information which is read from the PCD when it first connects.
859	SLINK	**NO PROBLEM FOUND** "No COB present" error. Problem not reproducable, original source files have been lost. The include file EXAMPLE.DEF probably contained $SKIP, which masked out the COB instruction.
860	SBUG	**NO PROBLEM EXISTS** ERROR 17: OUT OF MEMORY occurs on SBUG's "File Download":

This means that the PC does not have enough free memory to run the download function. The code for downloading is exactly the same in SBUG and SDNLD, but SBUG is a much larger program than SDNLD and needs more memory, which is why SDNLD works and SBUG doesn't. Also, 64K more memory is needed to download DBs into the PCD's extension memory.

Solution: Try running SBUG from the DOS prompt, or use PCD /X, as documented in the help files for this error.

861	SEDIT	ALREADY DONE

SEDIT *does* support `Symbol+offset`, but you must enter the offset in the SYMBOL column of the Edit screen, not on the Resource screen.

No further development of SEDIT will be done, apart from small updates for new PCD types etc.

862	SBUG	DELAYED

Allow "Batch Write" etc. even if off line.

See also 877.

863	Help	DONE

Help texts updated to describe XOB 15, 20 and 25.

PENDING: Updates to SRXM and STXM.

864	PG3	REFUSED

The modem configuration is stored in the extended header, which starts at CPU 0's program line 0. If a program has already been download for CPU 0, then the extended header cannot be created. The extended header must be created *before* downloading the program, by configuring S-BUS before the program is downloaded.

865	SCONFIG	DONE

A gateway cannot be configured for the PCD1 anymore.

866	SRES	DONE (V2.1 Beta-B)

Invalid SASI text error when Profibus text processed by SRES. Profibus texts were being checked as $SASI texts.

867	SBUG	DONE

For breakpoints, don't allow "Greater-than" or "Less-than" for floating point numbers because the PCD's breakpoint test firmware only does integer compares, not floating point.

868	SASM SLINK	DONE

Now allows TEXT, DB, COB, XOB, PB, FB, SB, ST and TR types in expressions in texts.

```
E.g.   MyText EQU TEXT 100
       TEXT 100 "This is ", MyText.T
       ;TEXT 100 is: "This is TEXT100"
```

SLINK has been modified so that external symbols are also supported.

869	General	REFUSED

Windows 95 does not support the (very) old DOS "APPEND" command. There is no need to use this command with the PG3. You must move into the directory containing your PG3 project, using "CD \path" before running the PG3 programs. This is described in the PG3's README.TXT and in PCD.EXE's help text.

870	General	WINDOWS 95 PROBLEM, see also SWER 892.

By default, Windows 95 keeps the port open if comms is done from DOS, until the DOS window is closed (EXIT done). The DOS window owns any ports which it uses. With Windows 3.xx, the port is closed when the DOS program finishes, not when the DOS window is closed, so this problem only occurs with Windows 95. To solve the problem, put COM<n>AutoAssign=2 in the [386Enh] section of SYSTEM.INI for each port you will be using, e.g. COM1AutoAssign=2.

871	Menus	DONE

Auto-answer mode now reads the station number of the connected PCD if the entered station number is invalid. There is no need to enter 255 anymore.

| 872 | Help | DONE |
| | | New XOBs and SYSCMP instruction now in help. |

873 General DONE
The PCD6.M3's PGU port is called channel 4, i.e. use SASI 4 to initialize it. We must use a value between 4 and 6 for the PGU port, because it must be stored in a 3-bit location in the PCD's S-BUS header: 000 (0) to 011 (3) are for ports 0..3, 111 (7) means "no PGU port". Therefore 4 is the obvious choice. Port 4 can be selected for the S-BUS PGU port or the gateway only if the PCD6.M1/M2/M3 PCD type is selected.

874 PCD.EXE DONE
The new S-BUS MODEM port and baud rate are now initialized properly at start-up when using an old PCDSETUP.DAT file from V2.0.

875 SCONFIG DONE
The PCD1 can now have extension memory, holding text/DBs 4000..4999. Help texts etc. updated.

876 PCD.EXE DONE
Could not connect to PCD2 (S-Bus station 1 at 9600 baud).
I cannot reproduce this, perhaps it was the same problem as 885 which has now been fixed.

877 SBUG DELAYED
Special connect options:
Try S-BUS data mode y/n
Try S-BUS parity mode y/n
Try S-BUS break mode y/n
Try to find station number (send read station telegram) y/n
Automatic re-connect y/n

52 SASM NO PROBLEM EXISTS
This is an excerpt from a FAX that I sent to Michael Kalleitner in Austria:

The "label not defined" errors are caused by a missing parameter to the "Diskput" macro, so that it thinks that the "asti" label is a macro parameter (macro parameters can be on more than one line). The "Stiabf" macro is being called without the "Anz" parameter, and it is not being passed on to the Diskput call at the end of the Stiabf macro (defined at end of GLOBAL.SRC).

```
...
ksti:
      diskput  tfw,Anz
asti:
endm
```

When macros are called, you should really enclose the parameters in brackets, so that the assembler does not confuse data on the next line with macro parameters. The call to Diskput should really be:

```
      diskput (tfw,Anz)
```

To save typing, we decided to allow macro calls without the brackets, but as you have found out, it can cause problems.

Note the "Parameter not used in macro" warnings. Another way to solve the problem would be to remove these unused parameters, then the error would also not occur because it would not confuse the label with a missing unused parameter. You could also put a NOP on the next line after `diskput`.

878 All DONE

Flash EPROM support implemented. One limitation, see SWER 879.

879	SDNLD	PENDING

Download "Extension Memory Initialization Segment" into Flash EPROM. This segment is currently only programmed into EPROMs by SPROM.EXE. It contains an image of extension memory, which is used to initialize extension memory (RAM) if it is found to be corrupted when the PCD starts up.

880	SBUG	DONE

It was only possible to write a single nonvolatile register at a time. "To" and "Count" options have been added to the "Write nonVolatile-register" command.
SBUG does not know how many nonvolatile registers a PCD has, because this has been changed several times in the PCD's firmware. Because of this, it reads and displays nonvolatile registers one at a time, and if a NAK response is received it assumes that the nonvolatile register does not exist, and issues this error message:
`ERROR 90: NONVOLATILE REGISTERS OR REG NUMBER NOT SUPPORTED BY PCD FIRMWARE`
When writing, it first reads the nonvolatile registers to see if they are all present, and issues the above error if NAK is received. *No* nonvolatile registers are written unless the entered To/Count range is valid.

881	SBUG	DONE

Now updates the modification indicator byte when the *first* change is made, instead of when "Write Program" is exited with ESCape.

882	SBUG	NO PROBLEM EXISTS
	SLOAD	

The "File Compare" command does *not* upload and compare the entire program, this would be very slow. It only compares the program sizes and their checksums. This is clearly stated in the help texts. If you want to do this type of compare you must upload the entire program into a .UPL file, and compare this with the .PCD file using the "Compare file" command on the "File handling" menu.
If the program in PCD memory is corrupted, i.e. by "Write bYte" then the checksum is still OK.

883	SBUG	NO PROBLEM EXISTS

Nonvolatile register 2000 is invalid!

884	SDNLD	DONE

Serial channel 4 is supported only by the PCD6.M3. When configuring S-BUS via a connection to a PCD6.M1 or PCD6.M2, SDNLD does not know that the CPU whose PGU port is channel 4 is an M3. It issued an error if the connected PCD was not an M3. There is no way for SDNLD to find out the type of the other CPUs in a PCD6 rack.
This check is now only done if the channel 4 is for the connected CPU. This means that it is now possible to configure channel 4 for an M1 or M2 in a mixed PCD type environment.

885	PCD.EXE	DONE

The wrong serial port was used for the S-BUS connection if an S-BUS MODEM connection has been previously done via a different port. The S-BUS connection tried to use the S-BUS MODEM port. PGU mode was OK.
This may also be the reason for SWER 876.

886	PCD.EXE	DONE
	SCONFIG	PCD.EXE (Connect menu), SCONFIG.EXE, and SCONNECT.EXE have been
	SCONNECT	updated to support the new S-BUS Data Mode. All online programs can now use this new protocol.

887	PCD.EXE	DONE

Simplified the connect menu according to Jean Tremblay's document "Simplifying the connect mechanism" (19.02.97).
There are now 3 modes: PGU, S-BUS and S-BUS MODEM.
PGU mode works as before (first tries P800 mode, then S-BUS parity mode to station

253).

S-BUS mode first tries parity mode to the station number entered in the menu. If that fails, it sends a "read station number" telegram. If that works then it connects to the returned station number, and fills in the station number in the menu. If this fails, it then does the same thing with break mode, and if that fials it tries data mode.

S-BUS MODEM mode is similar, except that parity mode is not used if connected via a public-line modem.

Each time a connect is tried, it starts with the last mode which worked. Every online program uses the same mechanism when it tries to connect. This is done inside the PG Library function Pg3Connect().

MODEM.DAT file:

Added "BreakMode=Yes/No" and "ParityMode=Yes/No" strings to MODEMS.DAT so that S-BUS break and parity mode can be enabled/disabled for certain modems, if required. If a modem doesn't support the mode, the downloader (SDNLD.EXE) checks the S-BUS configuration and issues this error if break mode has been selected for a modem which doesn't support it:

```
Error 39: Modem <type> doesn't support S-BUS Break/Parity
Mode.
```

These are also used to enable/disable the mode when using the new simplified connect mechanism.

888	SASM	DONE

$FATAL is now processed in pass 2 (was pass 1). This allows a listing to be produced which contains the $FATAL error message.

889	SASM	DONE

$IFDEF/$IFNDEF now detect symbols which are local to a macro. Symbols defined with LEQU and LDEF were not detected by $IFDEF/$IFNDEF.

890	All	DONE

Modified for use with PCD6.M3 according to the document "SW Modifications for PCD6.M3" by L.Joye (27.02.97).

SDNLD: Added these error messages, which can occur when downloading a new configuration:

```
Error 37: PCDx.Mx firmware does not support S-BUS Data Mode
Error 38: Only the PCD6.M3 supports serial channel 4
```

SASM: $PCDVER text corrected (was PCD4.M54x instead of PCD6.M54x). Added PCD6.M3xx text for $PCDVER.

SBUG: Now supports nonvolatile registers for the PCD6.M3.

891	SLINK	DONE

The text displayed by the linker SLINK has been improved to make it easier to understand. Changed from:

```
Text size:        123 bytes
Exten mem size: 456 bytes (Init size: 32 bytes)
```

to:

```
Text/DB size:   123 bytes (+ 32 bytes for Exten mem init seg if EPROM)
Exten mem size: 456 bytes
```

The (+ 32 bytes ...) text is only displayed if the PCD file contains an extension memory initialization segment.

892	PG3	WINDOWS 95 PROBLEM (PG3's README.TXT and PG4's help texts updated):

If any Windows 95 application is using a serial port, and a DOS application is started in a DOS window which tries to use the same serial port, then the personal computer stops responding (hangs). With Windows 3.xx, a contention dialog box is displayed, so this problem does not occur with Windows 3.xx.

This is a Windows 95 problem which can occur with *any* DOS application that uses serial communications (not just the PG3), see the Microsoft document "Device Contention in Windows 95" (document ID Q130402), available on the Microsoft Developer Network CD ROM (or web site).

To cure the problem, put this statement in the [386Enh] section of SYSTEM.INI: COM<n>AutoAssign=2 (where n is the port number 1..4, e.g. COM1AutoAssign=2), and restart Windows 95. This makes Windows 95 work in the same way as Windows

3.xx.
This also cures SWER 870, and stops the DOS window owning the serial port until it is closed.

V2.1 Beta-A

SWER	Program	Description/Action Taken
893	SBUG	DONE "Display data-Block x Element y Count z binarY Refresh" did not display the correct value for the last refreshed element. It always displayed the value of the first element.
894	SBUG	DONE Added "Display data-Block x Refresh" command to display the entire data block in the refresh window. Previously only "Display data-Block x Element y Count z Refresh" could be done. Note that the refresh window only holds 100 elements, so if the data block is bigger than this then you should use the "Element y Count z" format.
895	SBUG	DONE Further enhancement to "Display data-Block ... Refresh" to allow any display units to be used, e.g. "Display data-Block x Decimal/Hex/Bcd/binarY/Floating-point) Refresh".
896	SDNLD	DONE The PCD4 actually has 168KB of extension memory, not 172KB as is documented. This naturally caused "Error 22: User memory write error" when you tried to configure extension memory on a PCD4 because it always failed when verifying that 172KB of extension memory was present. We still use 172KB in the configurator, but the user will in fact have just 168KB at his disposal. NOTE: The PCD6.M4 actually has 183KB of extension memory (not 172KB as is documented). This means that 11KB can never be used. It is a lot of work to modify the documentation, and PG3/PG4 software to accept the actual values, so I suggest that we keep the 172KB settings.

V2.1 Beta-B

SWER	Program	Description/Action Taken
898	SDNLD	DONE The PCD6.M3 now supports data mode, the following error message is now only displayed for old PCD6.M3 firmware: Error 37: PCD6.M3 V000 firmware does not support S-BUS data mode Firmware versions X07 or V001 or above now support data mode.
899	SDNLD	DONE When connected to a PCD using S-BUS Data Mode, downloading a new S-BUS configuration which changed the baud rate caused the PCD to go off line. The baud rate must be manually changed using the configurator (PC Configuration/Serial ports for PC) before it could be re-connected. With Break and Parity mode, the baud rate is automatically updated and the PCD is reconnected using the new baud rate. There is also a similar problem changing the S-BUS signalling from Break or Parity mode to Data mode, or from Data mode to Break or Parity. When changing the baud rate or signalling mode, the UART is now re-initialized, and PCDSETUP.DAT is now updated with the new PC baud rate if S-BUS data mode is used.
900	SPROM	DONE When programming EPROMs with a program that has an extension memory initialization segment, SPROM failed if the segment spanned two EPROMs. This error message was generated: Error 6: Invalid PCD file: SPROM.$$2 The "$$2" means that the temporary extension memory initialization data file for CPU 2 is invalid. This was caused by a seek to the wrong location in the file if the data spanned two EPROMs.
308 ??	SBUG	REFUSED (Invalid SWER number from Jung) For "Write clocK", if the correct date (dd/mm/yy) is entered, but incorrect day number and week numbers are entered, they are still accepted. This is OK, we allow users to enter any day of week (1-7) and week of year (1-53) for any date, because different users may have different standards, i.e. Sunday = day 1 or Monday = day 1. There are also no international standards for when week 1 of the year actually starts.

V2.1 Beta-C

SWER	Program	Description/Action Taken

901	SASM	DONE
		EQUates which contained two forward references do not generate an error. This resulted in an invalid PCD file being created.
		`E.g. Sym1 EQU Sym2 ;forward reference to Sym2`
		`     Sym2 EQU Sym3 ;forward reference to Sym3`
		`     Sym3 EQU 100  ;Sym2 has two forward references`
		This now generates a "Symbol not resolved: Sym2" error for Sym1.

902	SLOAD	DONE Information from the "Up/download" menu was not saved (file name, CPU number).
903	SDNLD	DONE See also SWER 896. For certain memory configurations, downloading extension

memory still gave a "Memory write failed" error, but the data had been downloaded correctly.

| - | All | Full support for PC/104 communications with PCD2.M220. Select the "PC/104" port for S-BUS from SCONFIG's "Serial ports for PC" screen. This option is only displayed if the dual-port RAM is detected by SCONFIG. |

V2.1 Beta-D

SWER	Program	Description/Action Taken
904	SLOAD SDNLD SCONFIG SBUG	Now supports 4Mbit RAM or EPROM (512K bytes). (Flash EPROM to be done later.)
905	SBUG	DONE With a PCD configured for a public line modem on the PGU port, and a gateway port, the wrong S-BUS mode for the PGU port is displayed by the "Display s-bUs" command.
PG4 91	SASM	DONE If a macro was defined after it is used (forward reference), and is followed by a label, the assembler gives a "pass 2 phase error" at the label instead of an "undefined macro" error. Example:

```
        cob    0
               0
        ME_MUL r 1,2
label:
        ecob
ME_NUL macro val,exp
        mul    val
               k10^exp
               val
endm
```

Now issues `Error 167: Forward reference to macro: <name>`

PG4 237	SBUG	DONE The week of year calculation now conforms to ISO 8601. The last week of the year belongs to the previous year (week 52 or 53) if 4 or more days are in that year, otherwise it is week 1 of the next year. Previously we were using 3 or more *working days* (Mon..Fri).
-	Online	DONE S-BUS communications fails with certain OEM comms hardware. Clear receive buffer *after* sending message, not before. The V1.9 version of this function cleared it afterwards, and this allowed it to work if there's an echo. An important customer complained about this.
903 cont.	SDNLD	DONE Corrections to Flash EPROM handling. If the PCD has Flash EPROM, we cannot download the code or text segments separately because the "Flash Erase" telegram can only erase the entire program (we can't erase the code and text segments separately). Both code and text segments are always downloaded. Can now download to extension memory if Flash EPROM is fitted, it used to give a "header not initialized" error, and extension memory could not be used with Flash EPROM.

V2.1 Official Release

SWER	Program	Description/Action Taken
906	SBUG	DONE Add Production Information display to "Display cpu-Status" command.
907-909	-	Unused SWER numbers ?!
910	SBUG	DONE Overflow/underflow not detected for invalid floating point values when entered with SBUG's "Write Register … Floating-point" command. This only occurs on some of the latest Pentium microprocessors. e.g. "Write Register 0 2.710505E-20", result is 9.223370E+18 (FFFFFD7Fh) "Write Register 0 -2.710505E-20", result is -9.223370E+18 (FFFFFDFFh). Caused by different handling of microprocessor's overflow (OF) flag with the SHR (shift right) instruction. The OF flag is undefined if the shift count is greater than 1 e.g. in SHR BX,CL. Corrected code in function PcdAToFFP(). Also corrected in PG4's SCOMM.DLL.
911	SBUG	DONE When connected to a PCD4's CPU 1 in the debugger, switching the PCD off and on causes CPU 0 to be selected - CPU 1 is no longer connected. When the PCD4 comes back online, CPU 1 is now selected.
912	SBUG	DONE Updated the Production Info display format to look similar to the PG4's display, and changed the checksum calculation to match the (incorrect) calculation done in the factory.

913	SASM	DONE
		Corrected invalid "Error 153: Text/DB too long" error which occurred for some text declarations. E.g.
		
		``
		   TEXT 0 [5]
		   TEXT 1
		   "$R0000" ;Error 153: Text/DB too long
		``

914	SBUG PCD Menus	DONE When online in SBUG and connected to CPU 1 on a PCD4, if the PCD is disconnected and another PCD is connected which does not have CPU 1, SBUG would not go back online with the "Reconnect" command and now error message was displayed. If it can't connect to the previously connected CPU, it now connects to CPU 0 or to the physically connected CPU if PCD6.

*** END ***