

SURFACE VEHICLE INFORMATION REPORT

SAE J1924

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OEM/Vendor Interface Specification for Vehicle Electronic Programming Stations

Foreword—In our previous meeting, we tried to define an OEM to Vendor communications protocol. There were too many differences between what each vendor needed to establish a common RS-232 based protocol. We decided to have each vendor supply its own communications program. The OEM would host the vendor communications programs on the OEM production line computers.

1. **Scope**—The purpose of the SAE Information Report is to address the method of loading vehicle electronic controllers with chassis and customer specific parameters. This specification shall establish an interface definition. The interface definition must be mutually agreeable to truck OEMs and vendors. The purpose of this specification is not to answer the large protocol issues raised by systems such as GM's MAP.

1.1 **SAE Standard**—In the future, SAE may use this specification as a basis for an OEM/Vendor interface specification standard.

2. **References**—There are no referenced publications specified herein.

3. **Programming System**

3.1 **Plant System**—Each OEM will create its own system of programming vehicle control modules. This specification only addresses the programming station setup and the OEM/vendor interface. It does not suggest any specifics concerning the OEM's manufacturing system or production facilities.

3.2 **Station Setup**

3.2.1 **PROPOSED STATION**—The link between the OEM computer and the vendor interface tool is RS232c. The OEM host communications port shall support the 9 pin standard. The OEM host computer may have multiple ports or one common port. The common port is possible if the OEM provides an external switch. See the example in Figure 1.

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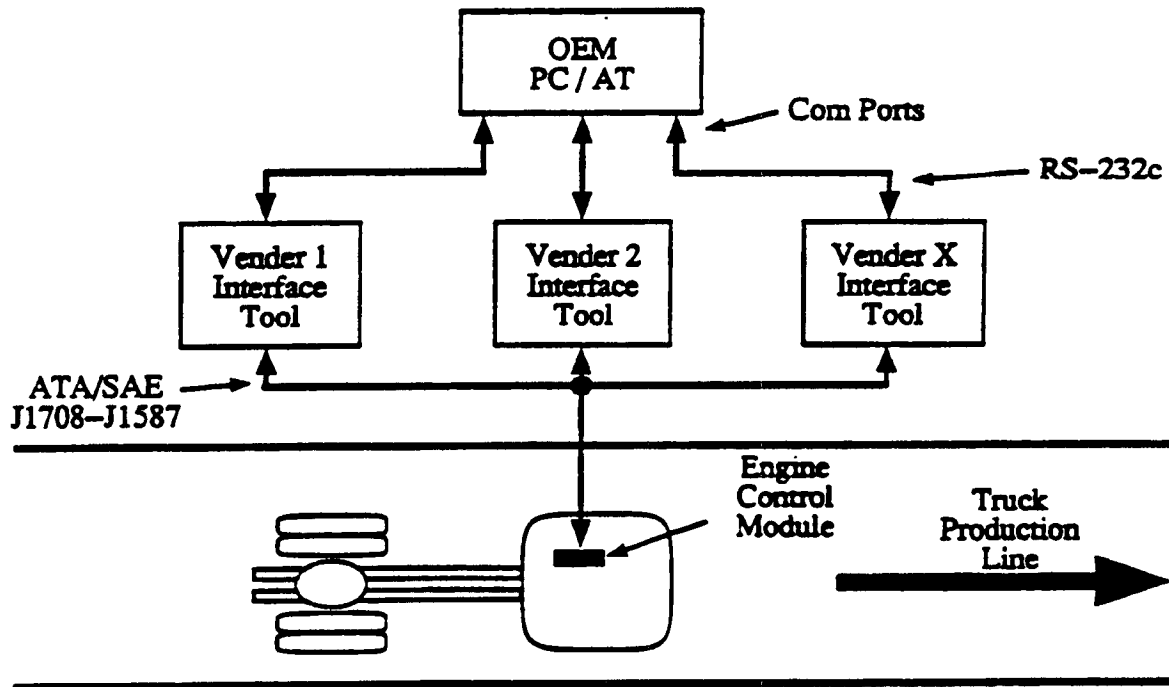


FIGURE 1—PRODUCTION LINE

3.2.2 PROPOSED SOFTWARE—The OEM production line PC shall execute an OEM production line program and the vendor communications programs. The OEM program shall gather customer and chassis specific parameter information from its manufacturing system and invoke the vendor program. The vendor program shall download the parameters via the host computer's communications port to the vehicle control module. The vendor program shall also return parameter verification and warranty data to the OEM program. The vendors shall supply the communication program to the OEMs as an executable program file (.exe). See example in Figure 2.

3.2.3 FUTURE DIRECTION—The OEMs want to phase out vendor tools used on the production line. In the future, an ATA communications card will replace the vendor interface tools. The OEMs intend to evolve to one ATA/SAE communications card which will plug into the host computer. This card will replace the vendor interface tools. The OEMs anticipate that the definition process will begin in the Spring of 1989. This should lead to a production line prototype in the early 1990s.

4. Interface Files

4.1 File Characteristics—Each interface file is an ASCII text file with multiple records. An end of line marker terminates each record and delimiters separate each field. A maximum character count limits the length of each field. If a larger field is needed, a field may contain a file name pointing to a separate file. An end of file marker terminates the file.

4.1.1 TEXT FILE FORMAT—The record fields may contain any printable (20H to 7EH) ASCII characters except the field delimiter. The comma shall delimit record fields and a carriage return line feed shall terminate each record. A control-Z shall mark the end of file.

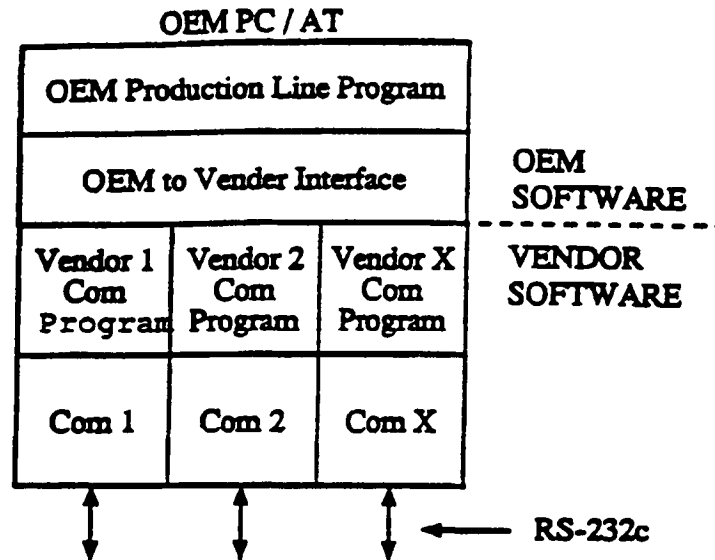


FIGURE 2—PRODUCTION LINE COMPUTER

- 4.1.2 **CASE SENSITIVITY**—The files may contain either upper or lower case alpha characters. However, the OEM and vendor programs are not required to make “case sensitive” tests. The programs shall interpret the upper and lower case alpha characters (A through Z) as being the same. For example, the programs shall interpret “COMx” as equivalent to “COMX”.
- 4.1.3 **FIELD LENGTH**—The field lengths shall be limited to 64 characters. Any field requiring more than 64 characters shall be passed as a file. Field may contain a file name which points to a separate file.
- 4.1.4 **FILE NAMES**—All vendor-supplied files shall conform to the following naming conventions. The file name shall include the vendor's company name, the version number, and the type of file. The first few letters of the file name shall be the vendor's company mnemonic and the following letters, the version number. The file qualifier shall identify the type of file.
- 4.1.4.1 *Vendor Mnemonic*—The first 5 characters of the file name shall identify vendor company name.
- 4.1.4.2 *Program Version*—The next 3 characters following the vendor mnemonic shall identify the version of the vendor file.
- 4.1.4.3 *File Type*—The 3-character file qualifier shall identify the file type. The following list itemizes the possible file types. See the example in Figure 3.
- Executable file = .EXE
 - Verification file = .VER
 - Definition file = .DEF
 - Parameter file = .PAR
 - Remarks file = .REM
- 4.1.4.4 *Examples*
- CECOM120.DEF—Definition file version 1.20 for Cummins Electronics Company
 - CATPL100.VER—Verification file version 1.00 for Caterpillar
 - DDALS210.EXE—Executable file version 2.10 for Detroit Diesel Allison

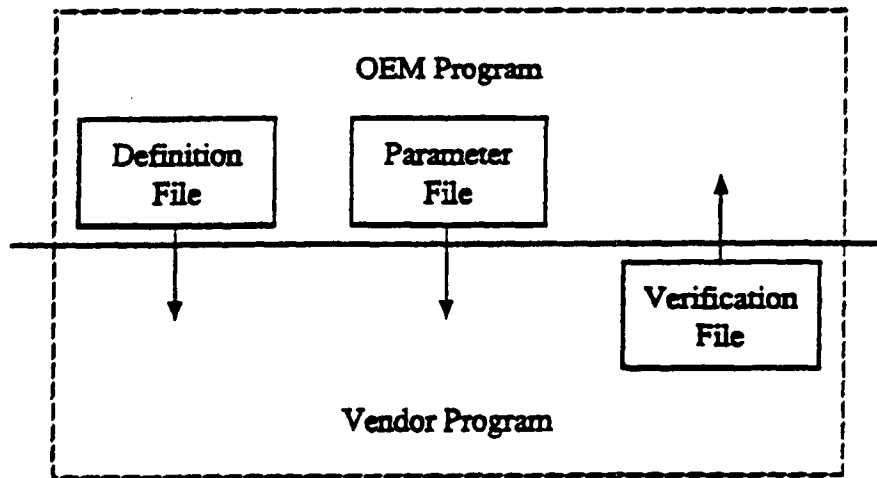
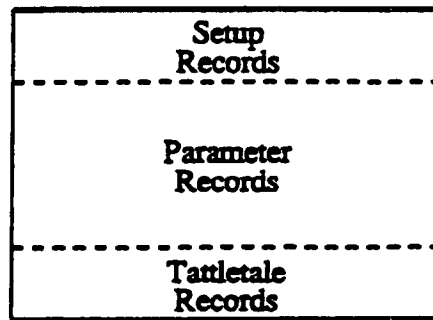


FIGURE 3—OEM/VENDOR INTERFACE FILES

- 4.2 Definition Files**—The definition file provides descriptive information for both the OEM and vendor programs. It contains a set of records necessary to describe vehicle controller parameters and tattletale warranty information. The definition file shall also contain setup configuration data for the OEM and vendor programs. Each definition file record will hold different sets of data and, therefore, have a unique record structure. The OEM and vendor shall jointly create and maintain the definition file. They shall perform these operations off-line. See Figures 4 through 7 as examples.

OEM Name	Vendor Name	Type	Units	Default Value	Lower Limit	Upper Limit	Increment
SpeedCal	BC00	BOTH	RPM	3000	0	3000	.5
SpeedLim	ADEF	BOTH	MPH	127	0	127	.5
RPMsSpeed	92CF	BOTH	RPM	3000	0	3000	10
LowCruise	ADC0	BOTH	MPH	127	0	127	.5

FIGURE 4—SAMPLE DEFINITION TABLE



Records grouped by Record Type
with remark records placed where needed

FIGURE 5—DEFINITION FILE STRUCTURE

SETUP RECORD:

3-Variable Data

2-Variable Name

1-Record Type

SETUP,EXEFILE,CECOM100.EXE<CR><LF>

PARAMETER RECORD:Unique
Fields

Future

9-Increment

8-Upper Limit

7-Lower Limit

Common
Fields

6-Default

5-Units

4-Parameter Type

3-Vendor Name

2-OEM Name

1-Record Type

PARMDEF,RdSpeed,BE00,BOTH,MPH,65,10,90,5<CR><LF>

TATTLEALE RECORD:

3-Vendor Name

2-OEM Name

1-Record Type

TTDEF,RdSpeedT,AA00<CR><LF>

REMARKS RECORD:

2-Comment

1-Record Type

REM,This is the new parameter<CR><LF>

FIGURE 6—DEFINITION FILE RECORD FORMATS

```

Setup
Records {
  REM,this is the newest PACEXY model<CR><LF>
  REM,host program 2.34<CR><LF>
  REM,COMPULINK SERIES B<CR><LF>
  REM,ENGINE CONTROL MODULE 2.00<CR><LF>
  SETUP,EXEFILE,CECOM234.EXE<CR><LF>
  SETUP,PARFILE,CECOM234.PAR<CR><LF>
  SETUP,VERFILE,CECOM234.VER<CR><LF>
  SETUP,REMFILE,CECOM234.REM<CR><LF>
  .
  .
  .
}

Parameter
Records {
  REM,This group of records have changed<CR><LF>
  PARM,RdSpeed,BE00,BOTH,MPH,65,10,90,5<CR><LF>
  PARM,PTOLIM,A0A0,READ,MPH,5,2,10,1<CR><LF>
  PARM,PULSES,90A0,WRITE,PPM,25000,10000,50000,1<CR><LF>
  .
  .
  .
}

Tattletale
Records {
  REM,THESE TATTLETALES ARE AS PER SAE J1990<CR><LF>
  TTALE,RDSPEEDTT,2000<CR><LF>
  TTALE,PTOLIMTT,2A00<CR><LF>
  TTALE,PULSETT,2B00<CR><LF>
  .
  .
  .
}

<EOF>

```

FIGURE 7—SAMPLE DEFINITION FILE

4.2.1 DEFINITION FILE RECORD TYPES—Each of the records shall contain a record type field. The record type field shall be the first field of each record. It shall indicate what the remaining fields of the record will contain. For example, if the record type field contains the ASCII character “P,” then the following fields of that record will contain parameter definition information. The first character of this field shall be one of the following:

- a. “S”—setup definition type record
- b. “P”—parameter definition type record
- c. “T”—tattletale definition type record
- d. “R”—remarks type record

Other characters may follow the first character but only the first is significant to the OEM and vendor programs.

4.2.2 DEFINITION FILE SETUP RECORDS—Setup records shall provide configuration data for the OEM and vendor programs. These programs shall read the setup records to find such things as interface file names. These records shall contain a field for a variable name and variable data. The variable name indicates the type of data contained in the record. The variable data field shall contain the record data. The following define types of setup records.