30.7.1974

MPS/AE/Note 74-15
30.7.1974

BRIEF STATUS REPORT ON EMAS

July 1974

H. Kugler, K.D. Metzmacher, P. Pearce and H. Riege

1. Review of EMAS Features
2. Expansion and Limitations
3. Hardware Status and Core Layout
4. Software Organization, Status of Monitor and Application Programs
5. Communication with the PS Computer Complex

* * * * * * *

1. Review of EMAS Features

1.1 EMAS is a multi task real-time system. Its users are, from the process point of view, FAK and slow ejection, from the access point of view people controlling the process via the DTS key-board display system, the DEC writer, directly linked to the computer, or via the PS computer complex.

1.2 The system, in stand-alone mode, provides full control of its entire process. Ejection hardware is under continuous surveillance. Programs for fault diagnosis excite error messages in the case of system deterioration.

1.3 The system allows, simultaneously to the running process, installation of special user tasks (e.g.: for maintenance purpose) and supplementary modules to the standard control software. This guarantees a dynamic process control on the FEC level.

1.4 It exists a protection scheme in a twofold sense.

1.4.1 Protection against faulty commands on ejection hardware (e.g.: a trial to pass high limits of currents or voltages of power supplies which will trigger on interlock and so interrupt ejection, is inhibited and the operator gets informed by an error message).

1.4.2 Protection of the monitor and the standard control software (it is achieved by the use of the different PDP 11/45 operating modes and memory protection). It means: trials in user programs to access and modify vital data or programs in an uncontrolled manner are inhibited.

Faults in not sufficiently debugged user programs resulting in halts or loops abort this special programs only and do not distrub other tasks running.

1.5 The system has an error checking and recovery scheme (e.g. DTS or powertail recovery).

1.6 The system can be decoupled into subsystems which autonomeously continue to work in the case of partial break-downs (e.g.: a break-down in the PDP 11 does not stop ejection).

1.7 The system has a high rate (like MAC 16 computers at NAL) of refreshing and treatment of data (frequency of 10 Hz).

2. Expansion and Limitations to Further Applications

The expansion of the system will be from 9 to 12 FAK modules and the implementation of TIMING hard- and software.

The limitations are: EMAS has a core-only machine. Its monitor is tailored for 28 k of core memory, therefore the number of tasks to be treated is restricted.

3. Hardware Status and Core Layout

3.1 All FAK Measuring and Command Units, as well as the Kick-Strength Unit, are in operation (for 9 FAK modules).

3.2 For slow ejection: 3 Power Supply Monitors (PSM) and a septum position monitor and command box are working (2 further PSMs are in implementation), 5 command boxes (ready for use) for system power supplies will be installed soon.

3.3 A DTS keyboard display system to control FAK and the slow ejection equipment works satisfactorily since 4 months.

3.4 The computer has actually a 16 k core memory of which up to 85% are already filled with software. The core use is as follows:

4 k Monitor (MINMON)
4 k Service Programs
4 k (fixed) FAK Programs
2 k FAK User Programs

Another 8 k will soon be needed. The core expansion will certainly reach 28 k.

4. Software Organization, Status of Monitor and Application Programs

4.1 Software Organization: Two sets of system software exist: control software (to guarantee real-time treatment) and monitor software.

4.2 Status of Monitor: The main features specified in the monitor (software protection, dynamic task installation, multi-tasking) are achieved.

4.3 Application Programs:

4.3.1 Slow ejection: Only a software structure exists, no application programs are written.

4.3.2 FAK : - KBD commands and equipment setting up.
- 5 display tables and their updating.
- Surveillance of good running of the system with generation of error messages.

With the completion of these programs the FAK can be run via the DTS-EMAS link from the MCR in a comfortable manner. The software mentioned above is in the final stage of debugging and at the next long shut-down it will be tested with the FAK equipment on-line.

5. Communication with the PS Computer Complex

Since autumn 1973 EMAS is open for the implementation of a communication monitor and a link to the PS computers.

Distribution: open

AE Group

CUC

D. Dekkers
J.H.B. Madsen
G.L. Munday
W. Remmer