A message from the vice president. . .

Gary Schumacher
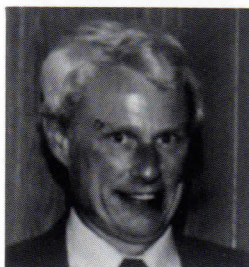
I would like to be able to report a dramatic improvement in the overall market situation for telemetry but unfortunately I cannot. Worldwide programs continue to be cancelled, delayed and downsized due to reduced budgets and economic recession. The difficult market has taken its toll on one of our competitors, Decom Systems Inc., (DSI). Recently they concluded their fiscal year with a loss of nearly $1 million on sales of $4.7 million. DSI is now in the process of being consolidated with another small company with a common management link called Coded Communications Incorporated (CCI). As a result, DSI will disappear as an independent company although they will probably continue to market telemetry products as a part of CCI. Competition continues to be fierce. Recently some orders have been lost to Veda Systems which is a newcomer to the medium size telemetry systems business. As yet they have sold but not yet fielded the System 30 which is their medium sized offering. Orders have been won on low price and promised performance. Their future as a competitive threat will depend heavily on their ability to deliver and perform on the contracts they have recently won.

In the face of these difficulties we are expending substantial effort to expand our addressable market and define our future product and development direction in order to adapt to the new world realities.

We are continuing to pursue the civil space marketplace in conjunction with Loral AeroSys of Seabrook, Maryland. We recently concluded a formal agreement with them to develop and market an O/S90 system which incorporates a standard satellite command and control software package. This will be a database configurable software package which will allow it to be adapted for use with various satellites and mission control centers. This is one of a family of satellite support software packages that AeroSys is porting from an existing VAX/VMS environment to an open system environment. They are currently using an O/S90 system on a Hewlett-Packard workstation as the platform to which the software is being ported. Because this is existing software which AeroSys has developed and migrated through various NASA and NOAA programs, it is expected to begin coming available in the near future. Currently we are planning to have a demonstrable O/S90 with satellite command and control capability by April 1993. Also in the civil space market area, substantial marketing and engineering effort is being directed toward the handling of packetized data in accordance with CCSDS and NASCOM standards.

The flight test marketplace is also continuing to be researched for ways to provide increased capability and functionality to the users. A new product identified as the Flexible Data Formatter has been defined and an R&D effort is underway. This product is expected to significantly increase the speed and efficiency with which post-test data processing can be achieved.

Considerable effort is being expended to better understand and predict the future direction of the telemetry processing market in general. Internal effort is being coupled with formal market research by a knowledgeable market consultant. From this effort and data we expect to define a plan for new lower cost hardware platforms compatible with O/S90 software which we will be able to adapt to rapidly evolving technology.

As a final note, the location of the 1993 sales meeting has been established as Portugal and will occur April 19th thru the 23rd. I hope to see you all there and discuss further the plans and programs necessary to respond to the new world around us. ∎

A message from Bud . .

Bud Hinkel, National Sales Manager

Team Selling

I n today's environment for our organization to survive and prosper, we must be able to capitalize on all opportunities. In order for us to do this, we must be able to deliver high quality products and services that meet or exceed the customer's requirements. This takes **team selling**. Team selling can be something as simple as taking a customer's call even if it is not within your sales territory or helping someone else on the sales team to ensure that the team meets its goals. It means that each member of our team must listen to each other, communicate and take the responsibility for resolving customer or team problems. Then we must work effectively to develop and implement solutions.

The idea that team selling is necessary more today than ever before can easily be seen when we examine the rapid change in technology. Several years ago, we were selling functional products. Today we are selling system products. This demand for high performance and strong technical knowledge of this

equipment has caused the requirement for high powered sales teams. In earlier times, we could rely more on planned scripts. Customers' needs were more similar than they were different. Today, customers' needs change quickly and they are diverse. This means you will have to **"think on your feet"** and quickly and clearly communicate the customers' changing needs to other team members. Decisions that used to be made in months are now made in weeks or even days because of the access to information and the flow of information. We have the tools to communicate (PC computers, modems, faxes, and cellular telephones).

The days when our competitive edge would last for years are long gone. We have seen our competition quickly become aware of our edge and not just duplicate, but leap frog to an even more advanced position. The quicker we act on disseminating any type of information, the better our chances stand on maintaining our competitive edge. If even one member of our team isn't included in this communication chain, it can destroy our edge. **Adaptability is the key.** The team must be able to respond in "real time" to customer problems or opportunities.

I believe over the past several years we have developed team selling, but like anything else we can always improve. There lays the challenge. ∎

Timeless Truths

Last year, The National Society of Sales Training Executives - a respected management and sales training organization - published the results of a major sales competency research study covering the secrets of sales superstars and the implications for the coming decade. Let's take a look at some of the findings to see if any of them come as a surprise.

Self-Depreciating Attitudes	Building Attitudes
I am a failure.	I am capable!
I can't do that because I might fail/people will laugh/it's too difficult.	I can do that because I want to and I believe I can!
I am not worthwhile.	I am worthwhile!
Someone won't let me do what I want to do.	I am in charge of my own destiny!
I must sacrifice for spouse/children/family.	I am entitled to my own happiness!
Life is too difficult.	Life is difficult and challenging!
I am too tired to try.	Trying will give me the energy I need to succeed!
I am too old.	I am alive and healthy!
I am too young.	I am filled with the energy of youth!
I am uneducated.	I crave knowledge!
I am stupid.	I am capable of learning!
I am unattractive.	All human beings are beautiful!
I am too fat/skinny/tall/short.	The inner self is where true beauty lies!
I do not have the money.	I am capable of getting as much money as I want.
I can't.	I can!
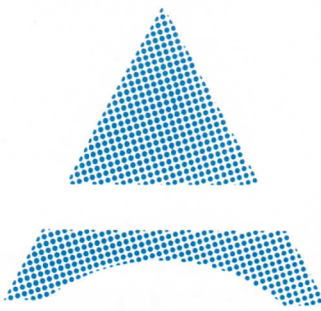
Derived Parameter Implementation In A Telemetry Preprocessor

Kathleen B. Bossert, Principal Software Engineer

Key Words

Derived parameter(s), Telemetry preprocessor

Abstract

Today's telemetry preprocessing systems are often required to create and process new telemetry parameters by combining multiple actual parameters in a telemetry data stream. The newly created parameters are commonly referred to as "derived parameters" and are often required for analysis in real time at relatively high speeds. Derived parameters are created through algebraic or logical combinations of multiple parameters distributed throughout the telemetry data frame. Creation and processing of derived parameters is frequently performed in telemetry system preprocessors, which are much more efficient at processing time division multiplex data streams than general purpose processors.

Providing telemetry system users with a "user friendly" method for creating and installing newly derived parameter functions has been a subject of considerable discussion. Successful implementation of derived parameter processing has typically required the telemetry system user to be knowledgeable of the telemetry preprocessor architecture and to possess software programming skills.

An innovative technique which requires no programming language skills is presented in this paper. Programmers or non-programmers may use the technique to easily define derived parameter calculations. Both single derived parameters and multiple derived parameters may be calculated in the preprocessor at high throughput rates.

Introduction

In the past, setup for a preprocessor was too complex for untrained people to understand. Users had to know preprocessor microcode or another programming language to create in-box calculated or derived parameters. This included parameters that were created within a preprocessor from one, two, or more input data parameters or measurands. Valuable time was spent learning the programming language and then writing, installing and debugging the algorithm.

If the user did not wish to write preprocessor microcode, then assembly language, and in some cases high level language programs, were written and installed to run on the preprocessor. Normally, this method still required a programmer to create and install the calculation program. In addition, preprocessor memories limited the number of available algorithms that could be maintained.

As another alternative method of data calculation, high level language data analysis programs were written on the host. Again valuable time was spent writing and debugging the program; consequently the efficiently of the high speed preprocessor was lost. By performing the calculations at the host, these real time calculated values were not stored on the archive file during data acquisition, and therefore required recalculation during data playback.

Derived Parameter Processing Setup

Engineers at Loral Data Systems have developed a new method for data calculation and preprocessor setup. The Loral Data Systems EMR O/S90 System allows managers, project engineers and any non-programmer system users to create calculated parameters using simple English language.

A novice user is able to define the parameter equation very similarly to the way he would write an equation on paper. By simply selecting mathematical functions from a pull-down menu list and stringing together several functions, the user may perform such calculations as velocity, engine torque, calibrated altitude, and calculated airspeed.

The O/S90 is based on an open architecture EMR 8715 Telemetry Preprocessor. Although this preprocessor has been in use in the field for many years, open architecture and derived parameter algorithm packaging are new additions. Refer to the overview diagram shown in Figure 1.

The Telemetry Preprocessor is driven via user setup, which resides in the Parameter Database. The Parameter Editor is used to define the incoming data stream, data compression and preprocessing to be performed, and output destination for telemetry data. Refer to the Parameter Editor Menu shown in Figure 2.
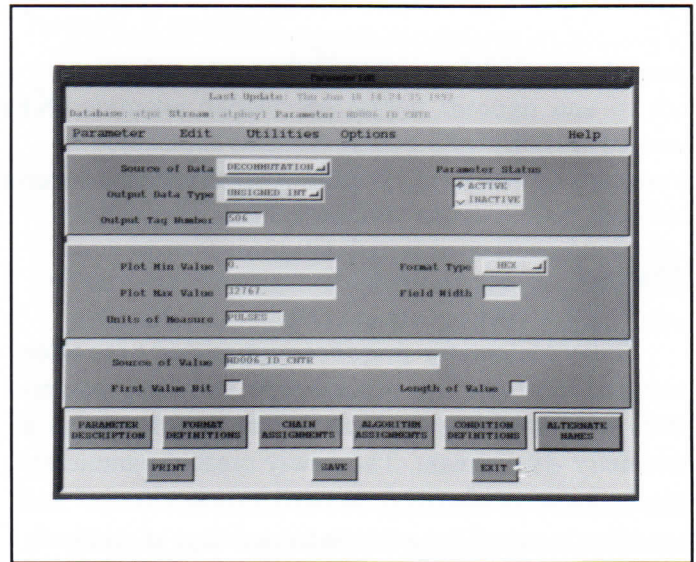

FIGURE 2

The Parameter Editor Format Definitions Menu defines real time input parameters by format location (such as word number, frame number, subcom unit, subframe number, interval). Refer to the Format Definitions Menu in Figure 3.
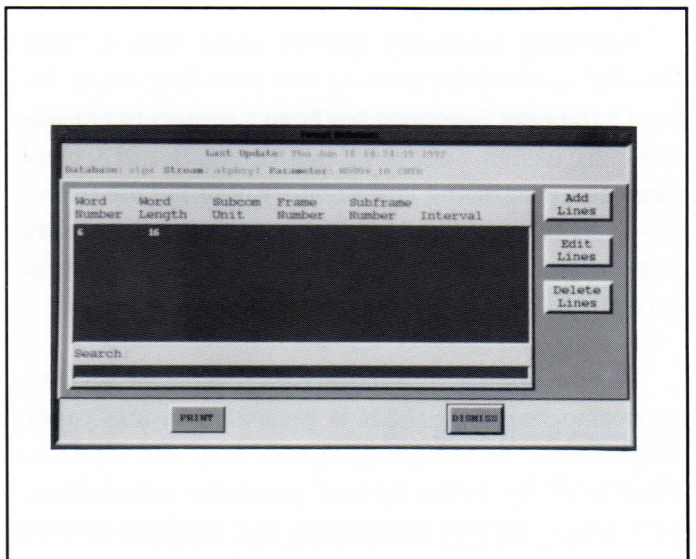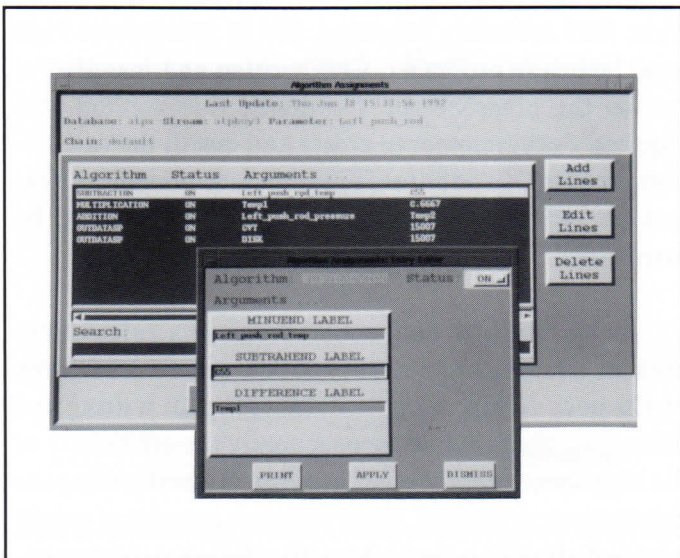

FIGURE 1

FIGURE 3

A series of algorithms, which are selected from a menu list, are assigned an algorithm chain name. The user may assign this predefined chain of algorithms to any of the parameters in the database. The algorithms contained in the original chain may be modified for every parameter in the database as required. Chaining commonly used algorithms and assigning a chain name eliminates the need to redefine the algorithm chain for each new parameter.

Derived parameter algorithms might include any of the normal data compression algorithms, as well as any of the following example set of predefined algorithms:

Addition	Arc Tangent
Subtraction	Arc Cosine
Division	1750 Floating Point
Multiplication	Store Constant to Label
Concatenation	Store Floating Pt. to Label
Arc Sine	Output Label Value
Square Root	Exponential
Bitwise AND	Bitwise complement (NOT)
Bitwise OR	Bitwise left shift
Bitwise right shift	Natural and common logarithms
Compare equal	Compare not equal
Absolute value	

Data calculation is made simple by creating and storing chains of algorithms in the Parameter Editor and then assigning selected chains to parameter names defined in the database. Figure 4 shows the Parameter Editor Chain Assignments menu, from which the user defines the algorithm chain(s) to be performed during creation of the resultant output parameter.
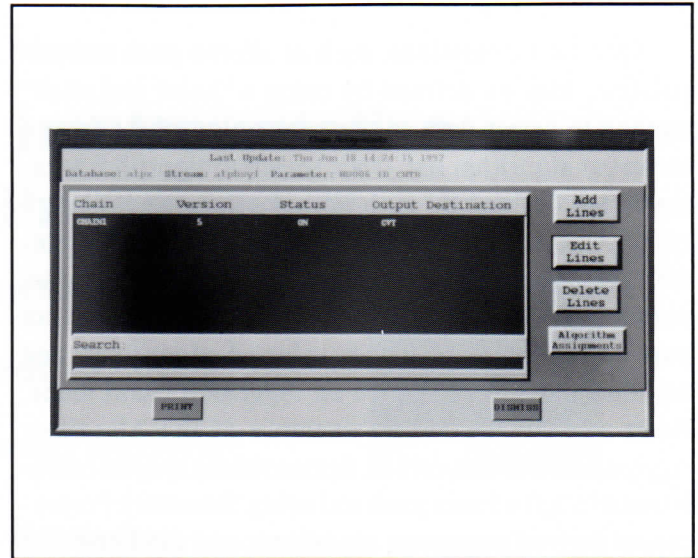

FIGURE 4

Arguments for algorithms are defined from the Parameter Editor Algorithm Assignments Menu. Information such as input variables, and preprocessor output port selections are defined for each parameter. Refer to Figure 5 for an example of the Algorithm Assignments Menu.
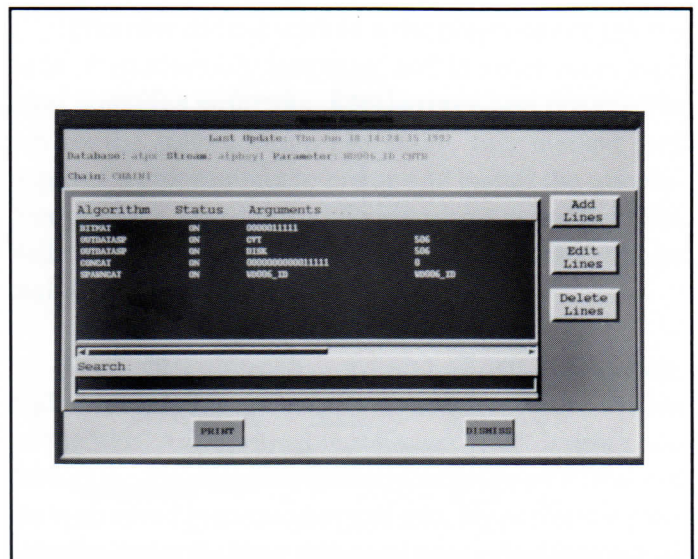

FIGURE 5

Specific calculations, such as aileron push rod calculation, may be defined by using a "point and click" method to select derived parameter algorithms from a menu bar algorithm list. Once selected, algorithm arguments are defined through tab selection and keyboard entry. Algorithm arguments may include other parameter names, previously defined constants, bit masks, output tag values and telemetry preprocessor output port selections. These user selected algorithms and argument lists are assigned an algorithm chain name. Refer to Figure 6 for an example of the Algorithm Assignments Menu, which demonstrates special calculation of a left aileron push rod using Telemetry Preprocessor derived parameter algorithms and the following formula.

LALPRC = .6667 (LALPRT - 55) + LALPRD

Where LALPRT is the left Aileron Push Rod Temperature.
Where LALPRD is the left Aileron Push rod

Pressure in pounds.
Where LALPRC is the resultant Left Aileron Push Rod value in pounds.

When database setup is completed, the user selects format compile and download. The assigned algorithms and arguments are automatically downloaded to the Telemetry Preprocessor data processing unit(s). User assigned calculations are processed in the data processing unit(s), and the newly derived parameter values are output through one of the preprocessor output modules. These derived parameter values are immediately available on the user's terminal for display and for output to other devices, such as strip chart via digital to analog converters. The derived parameter values are also stored on the archive device, eliminating the need for recalculation during playback.

Conclusion

The EMR O/S90 approach to creation and setup of real time derived parameter calculations provides unique advantages over other currently utilized methods. A highest order menu level interface that integrates equations, constants, and variables into a working data processing system has been described. Once a specific equation has been defined, it may be reused with or without modifications to create other derived parameters.
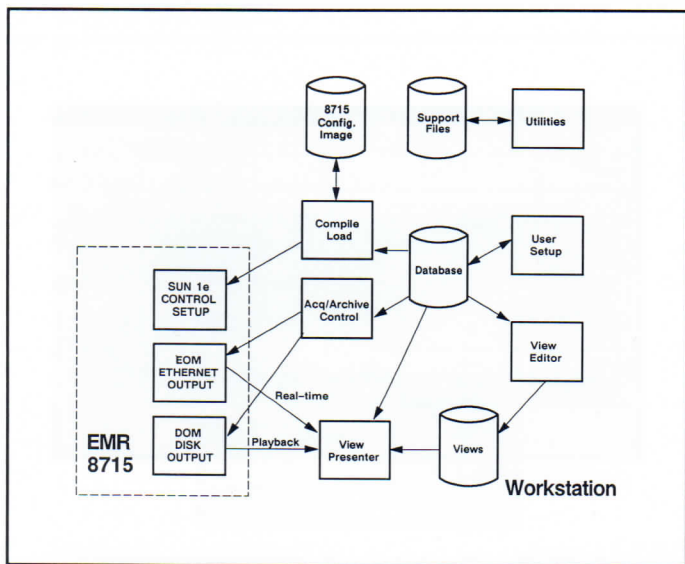

FIGURE 6

Product Line Input

Beth Rueger, EMR Product Manager

Hi, I am Beth Rueger. As the new Telemetry Product Manager, I look forward to working closely with all of you towards meeting our mutual goals. I am very excited about the possibilities and probabilities for our product line.

In this article, I would like to highlight the O/S90 Standard System configurations, the status of the PCX product, and the status of the Flexible Data Formatter (FDF) product.

Standard O/S 90
System Configuration

This section describes the six easy steps you follow to price a standard O/S90 System for our potential customers. By following these steps, you will be able to configure and price standard systems with minimum interface from Sarasota personnel. However, if a customer requirement necessitates a custom modification to the O/S90, then that modification must be estimated from the Sarasota Office.

The six steps to pricing an O/S90 are listed in Table 1. When reviewing the steps, refer to the accompanying Figure 1. Also, for actual prices, refer to the most current price list

**Loral Data Systems
EMR O/S90
Figure 1**

Table 1
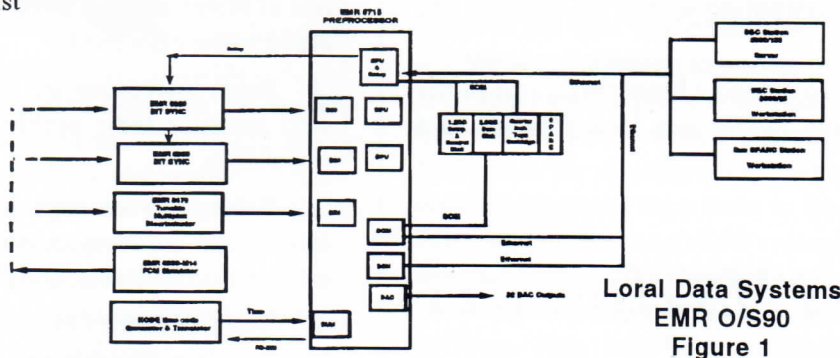
STEP	QTY
Step 1:	
EMR 7103-001 Up to two 8320's and one 8470	1
Step 2:	
EMR 7200D-001 DECstation 5000/133	1
For overseas jobs only add:	
EMR 7200D-100 Ingres Overseas License Fee	1
Step 3:	
EMR 7300K-001 Kode 285	1
Step 4:	
A. EMR 8320-002 PCM Bit Synchronizer	2
EMR 8320-102 Local Control Front Panel	2
EMR 8320-600 Non-tilt slides	2
EMR 8470-003 Tunable Multiplex Discriminator	1
EMR 8470-100 Local Control Front Panel	1
EMR 8470-600 Non-tilt slides	1
EMR 8715-500 Distributed Processing Unit	1
EMR 8715-702 Data Input Module	1
EMR 8715-1201 Decommutator Module	2
B. EMR 6010-021 SQL Database Interface 03 to 05 streams	1
Step 5:	
EMR 7500D-001 DECstation 5000/25	1
EMR 7500S-001 Sun SPARCstation IPX	1
EMR 6030-011 Display Controller	2
Step 6:	
A. Archive Option:	
8715-2410 DOM	1
8715-2450 Disk	1
OS6020-011 8715 Data Storage Software	1
B. 8715 DAC:	
EMR 8715-3200 32 Channel DAC Output Module	1
D. 8330-M14 Simulator:	
EMR 8330-M14 Multi Simulator	1
EMR 8330-600 Simulator	1
EMR 8330-600 Non-tilt slides	1
F. EMR OS6010-151 EMR 8470 Stream	1
EMR 6030-021 Graphics Editor	1

### EMR Personal Computer EXPRT (PCX) Desktop Telemetry System

The PCX product is in excellent shape. We will begin delivering the product to our first customers in this month. We currently have nine orders. Keep in mind that our PCX is a great upgrade for customers that have existing EXPRT's. It is also a wonderful single-stream system that supports PCM, PAM, or MUX inputs. Get out your order pads and we'll deliver!

EMR 8750 Flexible Data Formatter

Our Goal is to begin shipping the 8750 Flexible Data Formatter (FDF) to our customers in Q3 of 1993. The FDF will allow the telemetry user to program the front end hardware to output the telemetry test data in a format which can be directly accessed by the user's analysis software.

In a typical test environment, a one-hour test tape can be digitized in one hour or less. However, the data formatting process can take from one to eight hours, depending on the amount of data, the power of the computer, and the front end output format compatibility to the analysis input format. The FDF will save the user time during processing each flight test tape by eliminating the need for the data formatting step. Thus, the customer saves money!

The FDF is designed and configured to work with any version of the EMR 8715 Preprocessors. It will also work with any versions of our software (i.e. 8900, System 90, OS/90). Figure 2 Illustrates the FDF in a system.

**Loral Data Systems
External Flexible
Data Formatter** **Figure 2**
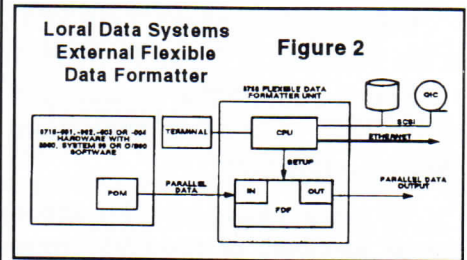
Initially four FDF product features will be offered and are as follows:

8750-001 Flexible Data Formatter Kit includes: FDF board with I/O Modules and memory, Cables, Documentation, Standard software for record building, processing, and output.

8750-200 Flexible Data Formatter Standalone Environment includes: VME Chassis, CPU. Note: The Chassis will house up to two FDF boards, one CPU, and one set of peripherals.

8750-400 Flexible Data Formatter Standalone Environment Peripherals includes: Disk, Quarter Inch Tape Drive, Monitor.

8750-600 Flexible Data Formatter Software Kit includes: DSP Compiler, Linker, Loader, Debugger, and Documentation. Note: The software kit is used for custom record building and processing.

Please note that when FDF is used in an 8715-004 O/S90 System, the peripherals (8750-400 can be configures with the 8715-004 chassis. However, the VMS-based 8715 systems will require the 8750-400 feature.

International News

John Hodgekinson,
International Marketing Manager

Welcome Aboard, Welcome Back,

Effective December 1, LORAL DATA SYSTEMS is formally represented in Finland by ELTICOM Oy.

Located in Espoo, a suburb of Helsinki, ELTICOM will bring over two decades of experience in the telemetry business to bear on the now universal problems of a post cold war Europe typified by reduced defence budgets and dwindling program requirements.

ELTICOM's Managing Director, Jorma Happonen, is no stranger to LDS, or rather EMR, for as a SCHLUMBERGER employee twenty years ago and later as their representative in Finland he was responsible for EMR sales.

Effective November 1, LORAL DATA SYSTEMS is formally represented in the Sultanate of Oman by SUHAIL & SAUD BAHWAN (SSB).

SSB is a substantial organization with particular interest and capabilities in the fields of data communications and computing within the defense and security community.

We would like to take this opportunity to extend a hearty welcome to the newest members of the LDS representative family and look forward to a mutually rewarding relationship. ■

Recent Systems Deliveries

Sandia O/S90	**Recent Orders**
Spanish Air Force O/S90	
EG&G Kennedy Space Center O/S90	**Edwards Air Force Base O/S90's**
NEC O/S90 ongoing thru Feb. '93	**Royal Australian Air Force PAP-3**
Martin TPPS, the third of 3 systems	**Fort Rucker O/S90**
Boeing 777 Prototype Certification	**McClellan A-10 O/S90**
Systems (special design)	**NASA Ames O/S90**
	MURUBAN/KH1 O/S90

❑ Outstanding salespeople have the ability to think from the customer's point of view. They understand they must earn the customer's trust, respect, and interest at each stage of the sale.

❑ Sales success today demands a radical shift from the peddler mentality of merely expounding on product features.

❑ Top performers ask better questions and listen more constructively to what the customer says, thereby gaining better information about customer needs.

❑ Sales superstars manage the use of their time and territory coverage more effectively.

❑ Sales successes go to those who increase their problem-solving ability.

❑ Sales achievers regard their relationships with key customers as advisers, consultants, and partners.

❑ Top performers are masters at collaborative negotiation.

Isn't it comforting to know that managers and trainers have been teaching salespeople the basic skills that will also be needed for future sales success? I'll bet most of us didn't know we were such visionaries! ■

Homer Smith, president of Marketing Education Assoc., Chevy Chase, MD writing in Sales & Marketing Management.