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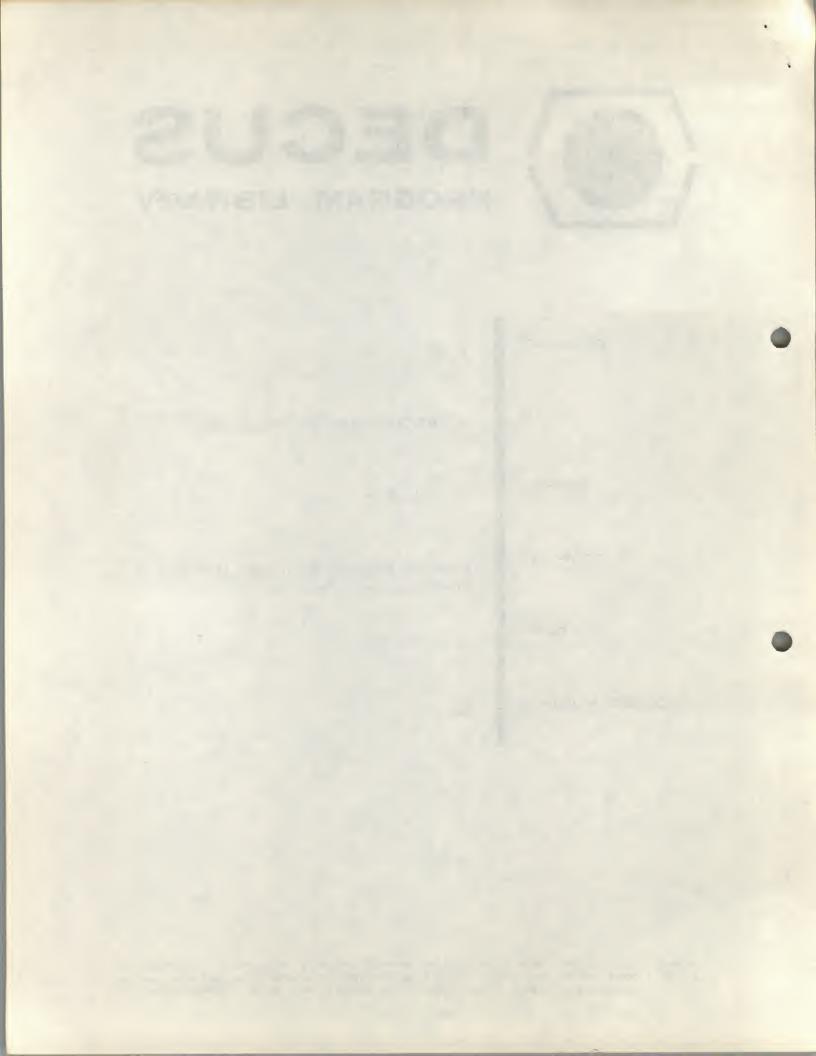|	
DECUS NO.	8-536
TITLE	ADVANCED AVERAGER IMPROVEMENT
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SOURCE LANGUAGE	PAL-D

INTRODUCTION.

This is a series of overlays to use the advanced averager program
under the PS/8 monitor system on the LAB- 8/I.
Added is a sixth part which transfers the calculated averages to
an output medium with use of the Command Decoder.
Each average is preceeded by a heading which contains the necessary
information - see description part VI -. The format of all numbers is
nine positions from which the first is the sign and the last is a
point,on DECTAPE packed in PS/8 ASCII Format.
This may be read in Fortran as a F9.∅ Format.
The averager are written as 1,2 or 3 numbers - acoording to the
calculated functions, (see Advanced Averager Manual) followed by
a carriage return.
The data may be read by PS/8 FORTRAN or PS/8 FOCAL.

Required:
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1   LAB-8/I with 8 k core.
2   one or more DECTAPES or any other mass storage device.
3   PS/8 monitor system.

1. Changes to the PART I of the Advanced Averager.

* 0005

0005	7700	L 7700	7700

* 700

0700	6037		6037

* 7376

7376	6272		6272

* 7553

7553	6002		IOF	
7554	7201		CLA	IAC
7555	6201		CDF	0
7556	6212		CIF	10
7557	4405		JMS	I L 7700
7560	0002		2	
7561	7573	NAME	AVG2	
7562	0000		0	
7563	7402		HLT	
7564	1361		TAD	NAME
7565	3372		DCA	BLNR
7566	6201		CDF	O
7567	6212		CIF	10
7570	4405		JMS	I L 7700
7571	0006		6	
7572	0000	BLNR	0	
7573	0126	AVG2	FIL NAM AVG2	
7574	0762			
7575	0000			
7576	2326			

2. Changes to part II of the Advanced Averager.
This part establishes name location for part III and changes
AVG2 sothat after being chained to part I it can be saved,
together with the rest of core as a compiled specific averager,
which can be called to average incomming signals.

GETPNT=0012
PUTPNT=0013
TEMP01=0146
KM0004=121
L7700=0005

*7465

7465	6002		IOF	
7466	1303		TAD	NAMLOC
7467	3012		DCA	GETPNT
7470	1304		TAD	TRANS6
7471	3013		DCA	PUTPNT
7472	1121		TAD	KM0004
7473	3146		DCA	TEMP01
7474	1412		TAD	I GETPNT
7475	3413		DCA	I PUTPNT
7476	2146		ISZ	TEMP01
7477	5274		JMP	.-3
7500	1305		TAD	CHRLC1
7501	3706		DCA	I JUMPER
7502	5707		JMP	I L7600
7503	7507	NAMLOC	NAM4-1	
7504	6273	TRANS6	6273	
7505	7543	CHRLC1	7543	
7506	7257	JUMPER	7257	
7507	7600	L7600	7600	
7510	0126	NAM4	0126	
7511	0764		0764	
7512	0000		0000	
7513	2326		2326	

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7543	6002		IOF	
7544	1307		TAD	L7600
7545	7041		CMA	IAC
7546	3146		DCA	TEMP01
7547	3012		DCA	GETPNT
7550	6201		CDF	1
7551	3412		DCA	I GETPNT
7552	2146		ISZ	TEMP01
7553	5351		JMP	.-2

7554	7201		CLA	IAC
7555	6201		CDF	0
7556	6212		CIF	10
7557	4405		JMS	I 17700
7560	0002		0002	
7561	7573	NAME	AVG3	
7562	0000		0000	
7563	7402		HLT	
7564	1361		TAD NAME	
7565	3372		DCA BLNR	
7566	6201		CDF 0	
7567	6212		CIF10	
7570	4405		JMS	I L7700
7571	0006		0006	
7572	0000	BLNR	0000	
7573	0126	AVG3	0126	
7574	0763		0763	
7575	0000		0000	
7576	2326		2326	

3. Changes to part III of the Advanced Averager.

*7555

7555	6002		IOF	
7556	7201		CLA	IAL
7557	6201		CDF	0
7560	6212		CIF	10
7561	4405		JMS	I	L7700
7562	0002		2	
7563	6274	NAME	AVG4	
7564	0000		0	
7565	7402		HLT	
7566	1363		TAD	NAME
7567	3374		DCA	BLNR
7570	6201		CDF	0
7571	6212		CIF	10
7572	4405		JMS	I	L7700
7573	0006		6	
7574	0000	BLNR	0	

AVG4= 6274

4. Changes to part IV of the Advanced Averager.

*7550

7550	6002		IOF		
7551	1372		TAD	CHANGE	
7552	3373		DCA	I	CHALOC
7553	7201		CLA	IAC	
7554	6201		CDF	0	
7555	6212		CIF	10	
7556	4405		JMS	I	L7700
7557	0002		2		
7560	7574	NAME	AVG5		
7561	0000		0		
7562	7402		HLT		
7563	1360		TAD	NAME	
7564	3371		DCA	BLNR	
7565	6201		CDF	0	
7566	6212		CIF	10	
7567	4405		JMS	I	L7700
7570	0006		6		
7571	0000	BLNR	0		
7572	0766	CHANGE	0766		
7573	6275	CHALOC	6275		
7574	0126	AVG5	FILNAM AVG5		
7575	0765				
7576	0000				
7577	2326				

5. Change to part V of the Advanced Averager.

This overlay is only necessary when a part VI is used to store
the averaged and calculated signals on Dectape. Else CTRL/C or
CTRL/P returns control to PS/8.

                                    * 7555

7555	6002		IOF		
7556	7201		CLA	IAC	
7557	6201		CDF	Ø	
7560	6212		CIF	1Ø	
7561	4405		JMS	I	L77ØØ
7562	ØØØ2		2		
7563	6274	NAME	AVG6		
7564	ØØØØ		Ø		
7565	74Ø2		HLT		
7566	1363		TAD NAME	
7567	3374		DCA	BLNR	
757Ø	6201		CDF	Ø	
7571	6212		CIF	1Ø	
7572	4405		JMS	I	L77ØØ
7573	ØØØ6		6		
7574	ØØØØ	BLNR	Ø		

                      AVG6=6274

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6. Assembly of the Advanced Averager under PS/8

Copy the Advanced Averager binary paper tape

Separate the copy into its five parts

All loading is done with ABSLOADER

a Load part I of the Advanced Averager and save as follows:

Save Sys AVG1 Ø - 7577; 6ØØ=ØØØØ

b Load part II of the Advanced Averager and save:

Save Sys AVG2 7ØØØ - 7577; 6777=ØØØØ

c Load part III of the Advanced Averager and save:

Save Sys AVG3 64ØO - 7577; 6527=ØØØØ

d Load part IV of the Advanced Averager and save:

Save Sys AVG4 64ØØ - 7577; 6777=ØØØØ

e Load part V of the Advanced Averager and save:

Save Sys AVG5 64ØØ - 7577; 6377=ØØØØ

f Load papertape containing part VI to save data on Dectape and save:

Save Sys AVG6 64ØØ - 74ØØ; 6377=ØØØØ

There are now two ways of patching the different parts.

I With the GET command get the different parts in core and use ODT to change the appropriate locations.

II. Compile with Edit and PAL the described instructions and overlay with the ABSLOADER as follows:

R ABSLDR

*Sys:AVGn CR n=1,2,3,4,or 5. CR=Carriage Return

*PTR:(or DTAn:NAME.BN)$

Save Sys AVGn aaaa-bbbb;cccc=dddd

according to the description above.

You now have a running version of the Advanced Averager under PS/8.

It must be used as follows:

-Call the first part with:R AVG1

Answer all the questions according to the manual with one restriction.
The user must prevent overloading of the last page of field one by
simple calculation according to the Advanced Averager manual. The
maximal space to be used is from location Ø23Ø + n*12+1 where n= the
number of different Averages and all calculation is done in octal to
6274 on field Ø and from Ø - 76ØØ on field 1.

This version won't run on more than 8 k !!

After answering the last question - punch controltape- with N(o), the
program chains automatically to part II which, when answers are given
returns to monitor.

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Save the program under your name as follows:

Save Sys AVNAME Ø - 7577; 7ØØØ=ØØØØ

This is the Averager you have to call when averaging has to be done.

Call: R AVNAME

Part II asks for trigger and timing signal. After the last carriage return this part automatically chains to part III after which the averaging can start. When averaging is done type CTRL/P to chain to part IV.

This does the necessary calculations after which part V is automatically called. Herewith you can plot and type etc. just as is described in the manual.

CTRL/P calls part VI which does the Dectape transfer.

Description of part VI.

This part uses the USR of PS/8 to transfer the calculated values of every point in the respective averaged signals to an output device. All output devices implied in the PS/8 systeem can be used but data are packed in PS/8 ASCII format which is 3 characters in 2 words. The Format under which the numbers are represented is FORTRAN F9.Ø.

All numbers begin with sign- space for plus -and end with a point.

According to the type of average - choosen in part I of the averager - there are one, two or three numbers on a line. The first is the averaged value of a point, the second its standard error and the third its trend value (see manual Advanced Averager for further information).

Each average is preceeded by a line of six numbers all in F9.Ø format.

They have the following meaning:

1= the number of this average in all averages as defined in part I

2= the number of points in this average

3= number of microseconds/point

4= delay used in this average

5= the type of average: 1= average only

2= average and standard error

3= average, standard error and trend.

6= number of sweeps for this average

The last average stored on the device is followed by zero's, filling the transfer buffer and CTRL/Z to close the file.

The only thing asked by this part are device name and file name.

This is indicated by the printing of a * at the beginning of a line by the command decoder as follows:

* device name :File name E←   9

If the extension is not given a zero extension is given.

If the back arrow is forgotten two possibilities exists:

1. When a non existing file name is given the error:
   FILE NOT FOUND is given and the command Decoder returns to wait for
   a new entry.

2. When an existing file name is given the program comes to an error
   halt which is fatal.

After the CR the program runs on its own and, on completion returns
control to the keyboard monitor.

The saved file can be used as input for calculation programs written in
FORTRAN or PS/8 FOCAL.

Under PS/8 FOCAL a warning is given that because of the used format sign
information, except from the first entry in a line is lost, due to the
fact that in FOCAL the value of a separatoris lost. Thisonly gives
problems with the sign of the delay, all other values, except the value
of an averaged point are positive. The sign of the averaged point is
retained because a separator-carriage return-preceedes.

Although the program is tested with many different averages it is possible
that some bugs still exists for situations not tested.

Three advices on the advanced averager

1. Due to some bug in part III the first word which contains the number
of sweeps of the first averager is not cleared by the normal procedure.
To overcome this make it a habit to start part III with a CTRL/Z which
clears all locations again, and this time also the first location of
average 1.

2. Due to the peculiar way of calculation in part V of the values slight
differences between the lowest order digit of part V print out and the
value of the saved file exist. The values in the file - divided by 1000 -
are good.

Because the values in core are in double word integer format which is
transferred as F9.0 you have to divide all values of the average by
thousend, except the values in the heading.

3. Due to individual differences between cycle time of different machines
an unintelligible halt can occur in part III. Although this is described
in the manual it is very often overlooked. Simply prolong the least
sweep interval, asked in part I and the trouble is over.

<div align="right">Dr. J.L. Blom,</div>