technical memorandum Daresbury Laboratory

DL/SCI/TM 17A

USER GUIDE TO THE SRS DATA LOGGING FACILITY.
II. RECOVERING DATA.

by

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FEBRUARY, 1979

Science Research Council

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1. INTRODUCTION

This report describes to the user how to operate the computer peripherals to obtain any one of the services described below. These services involve the recovery of SRS data from History records kept on the computer system.

There are three main tasks which the user can invoke to recover SRS History. These are:

HISTORY — Produces listings of parameters, or graphics plots, as requested between the start and end times given.

LOG — Produces a log of parameters for the date and time requested.

RESTORE — Restores the parameters of those that are controllable, to the settings that were recorded at the time requested.

Descriptions are given on how to run these tasks. This includes details of how to enter the parameter names, and what names are valid for any given task. It tells the user what keyboards are available for input. The user is also instructed in the use of the keyword parameters used to enter such parameters as date and time, and interval setting. This report also instructs the user on how to enter such complex parameters as date and time, which can take many formats.

There will be times when the service fails the user. At these times the user will be provided with information as to the nature of the fault. Much of this information is in the form of task completion codes. Details of their meanings are listed where applicable.

Because History is stored on files distributed throughout the Computer Network, some of these files being on tape, the user may experience some delay in the recovery of the requested data. The user will be instructed on how to monitor the progress of his task on the IBM 370/165 job queue by using the TSO "status" command.

The users output may be displayed on any of the terminals indicated below. Users are, however, reminded that graphics data will be displayed as rubbish on terminals that do not have graphics support.

The output information has been specially formatted to make full use of the several different types of terminal that are connected to the Network.

2. COMPUTER TERMINALS

A list of the terminal devices on the SRS Computer Network is given below. Each task is allocated a default device to which the output is routed, unless it is forced to another device by the inclusion of one of the device names listed below.

2.1 Input keyboards

Input messages may be entered at any one of the four keyboard devices at present connected to the Computer Network. These are:

CONS:	Terminet (SRS Computer Room)
KBD1:	Control Console 1
KBD2:	Control Console 2
KBD3:	Personnel Safety Console

2.2 Output terminals

The output may be directed to any of the terminal devices listed below, bearing in mind that text should not be directed to graphics terminals, and that graphics data should not be sent to alphameric terminals. These terminal devices are:

ANDJ:	Anderson Jacobson (text and graphics)
COL1:	Colour display (Control Console 1 upper screen)
COL2:	Colour display (Control Console 2 upper screen)
COL3:	Colour display (Personnel Safety Console upper screen)
COL6:	Colour display (Control Console 1 lower screen)
COL7:	Colour display (Control Console 2 lower screen)

COL8:	Colour display (Personnel Safety Console lower screen)
CONS:	Terminet (SRS Computer Room)
GDU1:	Graphics display unit (Control Console 1)
GDU2:	Graphics display unit (Control Console 2)
PR:	Line printer (SRS Ccmputer Room)
VDU0:	Video display unit (SRS Computer Room)
VDU1:	Video display unit (SRS Computer Room) - used for alarm indication with repeaters on Control Consoles 1 and 2
VERSATEC	IBM 370 VERSATEC Plotter

Error messages are only displayed at present on the Interdata 7/32 console, i.e. on the Terminet printer.

3. FORMATS FOR DATE AND TIME ENTRIES

The services which are described below have been developed to select default dates and times where none have been given in the parameter field. However, to make full use of these services, the user must become familiar with the formats of the date and time used on the system, in order to extract information from any record in the History files.

This entry of the date and time has been treated separately from the details of how to use the main services because the parameter field is strictly limited and dates and time may be truncated and still be able to select the required record.

For the sake of clarity the following abbreviations will be used throughout this document:-

Date	dy - day of the month (1 to 31)
	mh - month (1 to 12)
	yr - year (integer year - 1900)
Time	hr - hour of the day (0 to 23)
	me - minute (0 to 59)
	sd - second (0 to 59)

Date and time is normally entered following the appropriate keyword in the following format:-

dy/mh/yr hr:me:sd

The user may reverse this order with no ill effects and enter:

hr:me:sd dy/mh/yr

Restrictions to the number of characters that may be entered in the task parameter field have resulted in the following abbreviations being permitted.

If the date required is the current date then it can be omitted, and the message to be entered will be:-

hr:me:sd

Time to the nearest second, where History is recorded only every two minutes, is not a normal requirement, hence the time may be truncated to:-

hr:me

This is the normal way that the user will enter it when using these services.

Similarly the date may be truncated. We have seen the case where the date is omitted entirely from the message. Thus if the year is the current year, then the date may be truncated to:-

dy/mh

If both month and year are current then the date may be further reduced to:-

dy/

Note that the '/' is still retained. This is necessary in order

that the program may recognise the number as a date parameter and not a time parameter.

With any of the above formats the date and time may be entered in any order as they are both uniquely recognisable by the delimiting characters of '/' and ':'.

To further reduce the number of characters used up by the date and time, then a further constraint is added. This is that the date comes first, and the final two sets of characters represent the hours and minutes. Thus the date and time may be entered as:-

```
     dy mh yr hr me
or   dy mh hr me
or   dy hr me
or   hr me
```

With this format the hours and minutes can be run together, e.g.

```
     hrme,
```

where the minutes must contain two characters, e.g.

```
     0900
      900
     1205 etc.
```

The user may mix the modes, e.g.

```
     hrme dy/mh
or   dy/ hr me
```

The following ways of entering date and time are illegal:-

```
     hr:me dy mh
     hr me sd dy/mh
     dy hr me sd
```


4. RECOVERY OF RECORDS FROM THE IBM 370/165

History recovery tasks are started at an Interdate 7/32 keyboard as indicated above. The user needs no knowledge of the whereabouts of the records that have been requested. The task in the Interdata 7/32 searches its files to see if the records can be found there.

If they cannot be found, then the task creates the IBM 370 JCL to run a similar job in the IBM 370 batch mode. The user is informed when this occurs via the Interdate 7/32 console with the following messages:

```
time     taskid:DATE NOT HELD IN 7/32.  TRANSFERRED TO 370 PROGRAM.
time     taskid:END OF TASK      0
time     NETSERVE:TRANSFER OF DATA:JCLTEMP.DAT COMPLETE
```

to say that the JCL has been transferred to the IBM 370. The user may then go to any terminal logged ON to TSO to check on how the job is progressing by entering:

```
st(atus) srylog32
```

This will come back with the information as to how the job is progressing.

When SRYLOG32 terminates, then the data should be sent to the specified device. If it returns to the Interdata 7/32 via the Network, then the following message will appear on the 7/32 console:

```
time     NETSERVE:TRANSFER OF device       COMPLETE
```

The data should then be displayed on the device in question.

Data for the graphics terminals, and the restoration of parameters, will be indicated by the following messages respectively:

```
time     NETSERVE:TRANSFER OF DATA:PLOTFILE.DAT COMPLETE
time     NETSERVE:TASK PLOTHIST STARTED
time     PLOTHIST:END OF TASK         0
```

```
time      NETSERVE:TRANSFER OF DATA:SETTINGS.DAT COMPLETE
time      NETSERVE:TASK RESTORE STARTED
time      RESTORE:END OF TASK          0
```

5. HISTORY RECOVERY TASKS

To start any of the recovery tasks the user must go to one of the terminal keyboards listed in section 2.1 and enter the following command:

RUN taskname(,parameter field)

where the parameter field is optional in some cases. At keyboards other than the Terminet, instead of the RUN command the user may enter:

ST(ART) taskname(,parameter field)

On these terminals the START command frees the keyboard for further commands before the task has terminated. This is not necessary for the Interdata 7/32 console.

5.1 History

The user may display the History of selected SRS parameters, either as an alphameric listing, or as a graphics plot, in both cases as a function of time. This is done by going to any of the input keyboards described in section 2.1 and entering:-

RUN HISTORY,parameter list(start time end time interval device)

where parameter names can take any of the following forms, e.g.

```
section.group.itemnumber - single parameter items
section.group            - parameter groups starting at
                           section.group.01
section                  - sections of parameters starting at the
                           1st item
device                   - see section 2.2
```

A full list of all the SRS section, group, and item names which are

in use at the time of writing is given in Appendix I.

The items in the parameter field may be entered in any order. The maximum number of SRS parameters that can be displayed is 5 on the graphics and line printer terminals. The number of parameters is truncated for devices with shorter record lengths.

5.1.1 History keywords

The other items in the parameter field are controlled by keywords:-

```
FROM         - start time
               (time as described in section 3)
IN(TERVAL)   - interval
               followed by number of minutes
               e.g. IN 15
PL(OT)       - output device is a plotter
TO           - end time
               (time as described in section 3)
VERS(ATEC)   - output device is the IBM 370 Versatec plotter.
               This keyword must be accompanied by the keyword PLOT
```

5.1.2 History default settings

A maximum of 1000 records may be displayed on graphics or hard copy devices. Other devices are restricted to one page of data only. Parameter field data enclosed in parenthesis is optional. Under these circumstances the default settings apply. These are:-

```
device     - PR:(line printer)
interval   - 2 minutes
start time - start of History on 7/32 discs
end time   - last history recorded
```

5.1.3 History completion codes

The History task can set a return code to be passed to the user to indicate an abnormal termination. These return codes are:-

0 - successful completion
1 - Output device not assignable
2 - History file not assignable
3 - PLOTFILE cannot be allocated
255 - Task cancelled by operator

If any of the above errors occurs then the user may attempt to run the task again before calling for assistance.

5.1.4 History examples

Example 1 RUN HISTORY, LV.AUXL.01 LV.PIRG.02 FROM 29/ 7:30 IN 10

Permits 1000 records of the History of the Linac Vacuum Auxiliaries and Pirani gauge No. 2 to be printed on the line printer at 10 minute intervals starting from the 29th of the current month at 0730. If there are not 1000 records available, then it will terminate at the last recorded setting.

Example 2 RUN HISTORY, BV.IONP FROM 14/7 000 to 18/7 2359 PL VERS IN 10

Permits the first 5 items of the Booster Vacuum Ion Pumps to be plotted on the Versatec, starting at midnight on 13th July to midnight on 18th July. The interval of 10 minutes has been selected to spread 1000 records evenly between these times.

Example 3 RUN HISTORY,LC.SCTL

Permits all the History records of Linac Control Status Controllers contained on the Interdata 7/16 files to be listed on the line printer.

5.2 LOG

The user may display the Log of selected SRS parameters as an alphameric listing. This is done by going to any of the input kayboards described in section 2.1 and entering:-

RUN LOG,parameter list(time device)

where parameter names can take any of the following forms, e.g.

section - single section e.g. FM FB etc.
sector - a whole section of parameters e.g. L F B T etc.
section type - all parameters of a given type e.g. AR AM etc.

device - see section 2.2

The items in the parameter field may be entered in any order. The parameters are listed in columns. The number of columns across the page is selected, by the task, from a knowledge of the logical record length of the device.

5.2.1 Log keywords

The other items in the parameter field are controlled by keywords:-

AT - recorded time (time as described in section 3)

5.2.2 Log default settings

There are few parameters to set as defaults for this service. If no parameter is entered then it is assumed that a Log of all the SRS parameters is desired. The default options are as follows:

device - PR:(line printer)
time - last history recorded

5.2.3 Log completion codes

The Log task can set a return code to be passed to the user to indicate an abnormal termination. These return codes are:-

0 - Successful completion
1 - Output device not assignable
2 - History file not assignable
255 - Task cancelled by operator

If any of the above errors occurs then the user may attempt to run

the task again before calling for assistance.

5.2.4 Log examples

Example 1 RUN LOG

Permits a Log of the latest recorded settings of all the SRS Parameters to be displayed on the line printer.

Example 2 RUN LOG,LV BM.AT 1500 VDUO:

Permits a log of Linac Vacuum and Booster Magnets recorded at 1500 today to be displayed on VDUO.

Example 3 RUN LOG,AR

Permits a Log of all the latest recorded RF settings to be displayed on the line printer.

5.3 RESTORE

The user may Restore the analogue values of selected SRS parameters that can be given analogue control. This is done by going to any of the input keyboards described in section 2.1 and entering:-

RUN RESTORE,parameter list(time device)

where parameter names can take any of the forms shown in section 5.2. and may be entered in any order. The user is informed when the Restore has taken place.

5.3.1 Restore keywords

The other items in the parameter field are controlled by keywords:

AT - recorded time (time as described in section 3)

5.3.2 Restore default settings

There are few parameters to set as defaults for this service. If

no parameter is entered then it is assumed that a Restore of all the SRS parameters is desired. The default options are as follows:

Device - COL1:(colour display console 1)
time - last history recorded

5.3.3 Restore completion codes

The Restore task can set a return code to be passed to the user to indicate an abnormal termination. These return codes are:

0 - Successful completion
1 - Output device not assignable
2 - History file not assignable
3 - Settings file not assignable
8 - Procesio not assignable
255 - Task cancelled by operator

If any of the above errors occurs then the user may attempt to run the task again before calling for assistance.

5.3.4 Restore examples

Example 1 RUN RESTORE,AR AT 23/5 12:30

Permits the Restoration of all the RF parameter values recorded at 1230 on the 23rd May. Output messages will be displayed on Console 1 colour display.

Example 2 RUN RESTORE,BM FD AT 16/ 2300

Permits the Restoration of the Booster Magnet and Flight Path Collimator settings to those recorded on the 16th inst. at 2300 hrs.

APPENDIX I.

S.R.S. HISTORY GUIDE

DATE: 15/11/78

APPENDIX I

SRS SECTIONS, GROUPS and ITEMS

as at November, 1978

CONTENTS

** SRS ** LINAC VACUUM

SECN	GROUP	DESCRIPTION	ITEM	SIGNALS IN GROUP		
				ANALOG		STATUS
			NO	READ	SET	
LV	AUXL	VAC AUXILIARIES	1			1
	PIRG	VAC PIRANI GAUGE	2	2		2
	PENG	VAC PENNING GAUGE	2	2		
	IONP	VAC ION PUMP	2	2		2
	IONV	VAC ION PUMP HT VOLTS	2	2		
	VALV	PNEUMATIC GATE VALVE	1			1

** SRS ** LINAC GUN

SECN	GROUP	DESCRIPTION	ITEM	SIGNALS IN GROUP		
				ANALOG		STATUS
			NO	READ	SET	
LG	HTRB	GUN HEATER & BIAS	1			1
	HTRV	GUN HEATER VOLTS	1	1	1	
	BIAS	GUN BIAS VOLTS	1	1	1	
	TIME	TIMING PULSE	1	1	1	

SECN	GROUP	DESCRIPTION	ITEM NO	SIGNALS IN GROUP ANALOG READ	ANALOG SET	STATUS
LR	DHTR	DRIVE KLYSTRON HEATER	1			1
	DHTV	DRIVE KLYSTRON H.T. VOLTS	1	1	1	1
	DHTI	DRIVE KLYSTRON H.T. CURRENT	1	1		
	DBSV	DRIVE KLYSTRON BOOST VOLTS	1	1		
	BIAS	PULSE TRANSFORMER BIAS CURRENT	1	1		
	KVAC	MAIN KLYSTRON VACUUM	1	1		
	IONV	VACUUM ION PUMP HT VOLTS	1	1		
	HTRB	MAIN KLYSTRON HEATER & BIAS	1			1
	HTRV	MAIN KLYSTRON HEATER VOLTAGE	1	1		
	HTRI	MAIN KLYSTRON HEATER CURRENT	1	1		
	KFCS	MAIN KLYSTRON FOCUS CURRENT	1	1	1	1
	KHTV	MAIN KLYSTRON H.T	1	1	1	1
	KHTX	MAIN KLYSTRON AUX INTERLOCKS	2			2
	KHTI	MAIN KLYSTRON H.T. CURRENT	2	2		
	KBSV	MAIN KLYSTRON BOOST VOLTS	1	1		
	PBAT	PREBUNCHER ATTENUATOR	1	1	1	
	PBPH	PREBUNCHER PHASE SHIFTER	1	1	1	
	TIME	TIMING PULSE	2	2	2	
	FORP	FOWARD RF. POWER	1	1		
	TEMP	CORRUGATED WAVEGUIDE TEMP	1	1		

SECN	GROUP	DESCRIPTION	ITEM NO	SIGNALS IN GROUP ANALOG READ	ANALOG SET	STATUS
LC	SCTL	STATUS CRATE CONTROLLER	3			3

SECN	GROUP	DESCRIPTION	ITEM NO	SIGNALS IN GROUP ANALOG READ	ANALOG SET	STATUS
LM	AUXL	WATER SERVICES	1			1
	PSUP	BEAM STEERING POWER SUPPLIES	1			1
	BFCI	GUN BUCKING FOCUS	2	2	2	
	FGSI	FOCUS CURRENT	4	4	4	4
	VSTR	VERTICAL BEAM STEERING	3	3	3	
	HSTR	HORIZONTAL BEAM STEERING	3	3	3	

SECN	GROUP	DESCRIPTION	ITEM NO	SIGNALS IN GROUP ANALOG READ	ANALOG SET	STATUS
PV	AUXL	VACUUM AUXILIARIES	1			1
	PIRG	VACUUM PIRANI GAUGE	1	1		1
	PENG	VACUUM PENNING GAUGE	2	2		
	IONP	ION PUMP	4	4		4
	IONV	VACUUM ION PUMP HT VOLTS	4	4		
	VALV	PNEUMATIC GATE VALVE	1			1

** SRS ** FLIGHT PATH MAGNETS

SECN	GROUP	DESCRIPTION	ITEM NO	SIGNALS IN GROUP ANALOG READ	ANALOG SET	STATUS
FM	AUXL	BEAM STEERING AUXILIARIES	1			1
	PSUP	BEAM STEERING POWER SUPPLIES	1			1
	VSTR	VERTICAL BEAM STEERING	4	4	4	
	HSTR	HORIZONTAL BEAM STEERING	3	3	3	
	DIP	BENDING MAGNET	2	2	2	
	FQUD	HORIZONTAL FOCUSSING QUADRUPLE	3	3	3	
	DQUD	HORIZONTAL DEFOCUSSING QUADRUPOL	3	3	3	
	MAGT	MAGNETOMETER	2	2		

** SRS ** FLIGHT PATH BEAM

SECN	GROUP	DESCRIPTION	ITEM NO	SIGNALS IN GROUP ANALOG READ	ANALOG SET	STATUS
FB	HCOL	HORIZONTAL COLLIMATOR	2	2	2	2
	VCOL	VERTICAL COLLIMATOR	1	1	1	1
	STOP	BEAM STOP	1			1

SECN	GROUP	DESCRIPTION	ITEM NO	SIGNALS IN GROUP ANALOG READ	ANALOG SET	STATUS
BV	AUXL	VACUUM AUXILIARIES	1			1
	PIRG	VACUUM PIRANI GAUGE	2	2		2
	PENG	VACUUM PENNING GAUGE	4	4		
	IONP	ION PUMP	8	8		8
	IONV	ION PUMP H.T. VOLTAGE	8	8		
	TBMP	TURBO-MOLECULAR PUMP	1			1
	VALV	BOOSTER VACUUM VALVE	3			3

SECN	GROUP	DESCRIPTION	ITEM NO	SIGNALS IN GROUP ANALOG READ	ANALOG SET	STATUS
BR	AUXL	RF.AUXILIARIES	1			1
	DHTR	RF. DRIVE HEATERS	1			1
	BIAS	RF. BIAS VOLTAGE	1	1		
	DAV	RF. ANODE VOLTAGE	1	1		1
	DAC	RF. ANODE CURRENT	1	1		
	DSV	RF.SCREEN VOLTAGE	1	1		
	DSC	RF. SCREEN CURRENT	1	1		
	DRIV	RF.DRIVE	1			1
	TIME	TIMING PULSE	2	2	2	
	PROG	R.F PROGRAMME AMPLITUDE	1	1	1	
	PHAS	R.F PHASE	1	1	1	
	TUNE	CAVITY DETUNING	1	1	1	
	CAFB	BOOSTER RF. CAVITY FEEDBACK	1			1
	ATRC	AUTO TUNER RESET	1			1

SECN	GROUP	DESCRIPTION	ITEM	SIGNALS IN GROUP		
				ANALOG		STATUS
			NO	READ	SET	
BC	SCTL	STATUS CRATE CONTROLLER	3			3

SECN	GROUP	DESCRIPTION	ITEM	SIGNALS IN GROUP		
				ANALOG		STATUS
			NO	READ	SET	
BM	ACPV	A.C. POWER SUPPLY VOLTAGE	1	1		1
	ACPI	A.C. POWER SUPPLY CURRENT	1	1	1	
	ACSV	A.C. POWER SUPPLY SERVO ERROR	1	1		
	ACPF	A.C. PEAK FLUX	1	1		
	DCPV	D.C. POWER SUPPLY VOLTAGE	1	1		1
	DCPI	D.C. POWER SUPPLY CURRENT	1	1	1	
	DCSV	D.C. POWER SUPPLY SERVO ERROR	1	1		
	WATR	WATER SERVICES	1			1
	ENGY	ENERGY (GATED INTEGRATOR)	1	1		
	BINJ	INJECTION FIELD	1	1	1	
	AUXL	ORBIT CORR. AUXILIARIES	1			1
	PSUP	ORBIT CORRECTION POWER SUPPLIES	1			1
	PFWS	POLE FACE WINDINGS	4	4	4	4
	VSTR	HELMHOLTZ COILS	8	8	8	
	HSTR	HORIZONTAL BEAM STEERING	16	16	16	

SECN	GROUP	DESCRIPTION	ITEM	SIGNALS IN GROUP		
				ANALOG		STATUS
			NO	READ	SET	
BI	HTRB	HEATER & BIAS	2	2		2
	KICK	BOOSTER INJECTION KICKER	2	2	2	2
	SEPT	BOOSTER INJECTION SEPTUM	1	1	1	1
	SPOS	INJECTION SEPTUM POSITION	2	2	2	2
	TIME	INJECTION TIMING	3	3	3	

SECN	GROUP	DESCRIPTION	ITEM	SIGNALS IN GROUP		
				ANALOG		STATUS
			NO	READ	SET	
BE	HTRB	HEATER & BIAS	3	3		3
	KICK	BOOSTER EXTRACTION KICKER	2	2	2	2
	SEPT	BOOSTER EXTRACTION SEPTUM	1	1	1	1
	BUMP	BEAM BUMP	1	1	1	1
	TIME	EXTRACTION TIMING	3	3		

SECN	GROUP	DESCRIPTION	ITEM	SIGNALS IN GROUP		
				ANALOG		STATUS
			NO	READ	SET	
BB	BTNQ	BETATRON Q MONITOR	1			1
	VRTQ	VERTICAL Q MODE	1			1
	AMPL	BETATRON Q AMPLITUDE	1			
	TIME	BETATRON Q TIMING	1	1	1	
	WDTH	BETATRON Q PULSE WIDTH	1	1	1	
	FREQ	BETATRON Q FREQUENCY	1	1		
	TUNE	BETATRON Q TUNING	1	1	1	1

SECN	GROUP	DESCRIPTION	ITEM	SIGNALS IN GROUP		
				ANALOG		STATUS
			NO	READ	SET	
SM	MP01	PROTOTYPE MULTIPOLE MAGNET	12	12	12