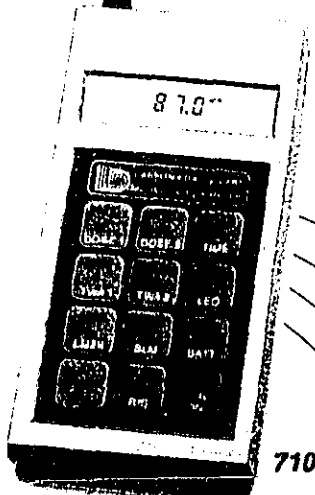n-96-01
II-A-805

THE 700 SERIES

Sound Level Meters/Dosimeters

Some outstanding common functions are:

- 110 dB Dynamic Range
- Accurate Measurement of Gunfire
- Analysis of Peak Data
- Data Report directly to Printer
- Built In Data Logging
- GSA Contract / 2 yr. Warranty

8 7.0

8 1.2 (dBA)

4 0.0 G.,

1 8 4.0 %

1 2 8.8

HISTORY S   4
81.0dBA 108.5PK

DOSE   3.7 % A
SLOW   0:02:23

LOSHA 104.7 dBA
SLOW   0:02:23

STATISTICS
LMAX   127.0 dBA

710

700

Designed for routine applications. Custom formatted reports. Two doses, TWA's, Projected Doses. Single Key operation. Type II or Type I Accuracy Available.
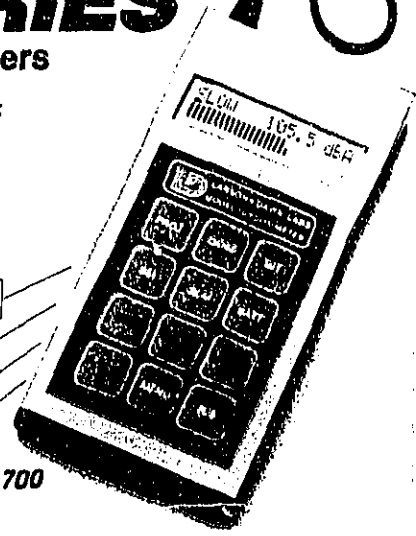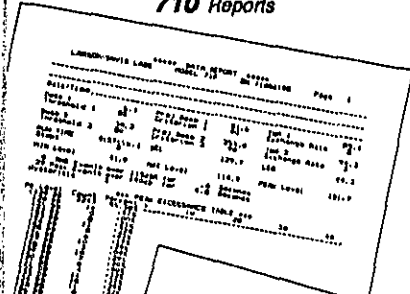
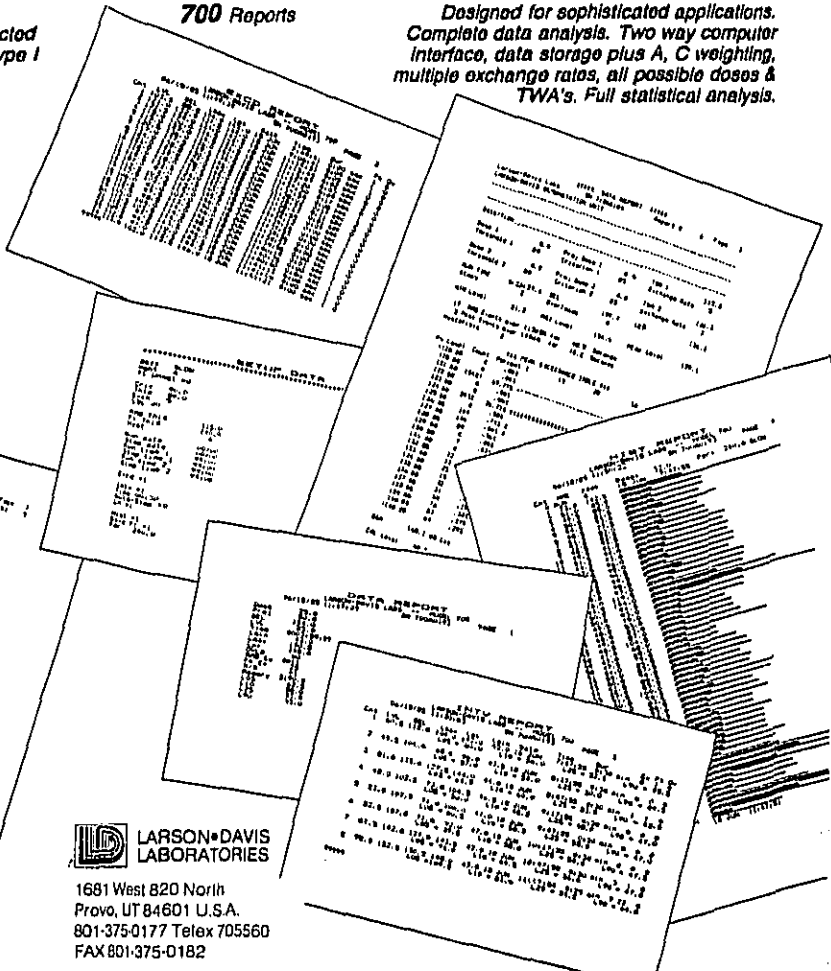*Designed for sophisticated applications. Complete data analysis. Two way computer interface, data storage plus A, C weighting, multiple exchange rates, all possible doses & TWA's. Full statistical analysis.*

710 Reports

700 Reports

LARSON•DAVIS
LABORATORIES

1681 West 820 North
Provo, UT 84601 U.S.A.
801-375-0177 Telex 705560
FAX 801-375-0182

POOR
COPY

Model 710
Integrating Sound Level Meter
Noise Dosimeter

LARSON•DAVIS

The **Model 710** Dosimeter/Integrating Sound Level Meter from LARSON•DAVIS Laboratories introduces a new era of simplicity in noise measurement, without sacrificing features or operating accuracy. Designed for routine applications, the **710** provides two values of Dose, Projected Dose, and Time-Weighted Average (TWA) simultaneously. A third TWA is available with the LEQ function. The convenience of more than one Dose at the push of a key allows the user to verify both of OSHA's requirements (Dose with an 80 dB threshold and Dose with a 90 dB threshold) with one measurement.

Seventeen Different Measurements

Measurements for Dose 1:

Dose 1
Projected Dose 1
Time Weighted Avg 1

Measurements for Dose 2:

Dose 2
Projected Dose 2
Time Weighted Avg 2

Measurements for Leq:

Integrated Sound Level (LEQ)
Sound Exposure Level (SEL)

General measurements:

Instantaneous Sound Pressure Level(SPL)
Maximum RMS Level (LMAX)
Minimum RMS Level (LMIN)
Peak Level-Unweighted
Total Measurement Time
Time over 115 dBA RMS
Time over 140 dBL PEAK
Number of Overloads
Battery Life in Percent

Annotated Display

LARSON•DAVIS designed a mistake-proof display for data readouts which shows the function key pressed along with the parameter value and proper units. Errors due to pushing the wrong button and misunderstanding what the display represents are virtually eliminated.

Rugged Design

The **Model 710** is built to be a survivor. With its sealed keyboard and rugged case design, it can perform well in harsh environments. Tested at very high and low temperatures and humidity, the **710** is certified to hold its superb accuracy in extreme conditions.

All electronic circuits are completely enclosed with noise-reducing copper shields, enabling the **710** to measure sound pressure levels much lower than competitive instruments. The copper shields also minimize EMI and RFI radiation influences allowing its use in power plants and other high radiation areas. UL and BASEEFA intrinsic safety certifications are available for the **Model 710**.

Measured values are stored in virtual memory for several months or until the operator performs an intentional reset. Data will even survive low batteries and battery changes.

Measuring Accuracy

Ambient noise levels in the work place can range from very small to very large SPLs over short intervals of time. Noise impulses (caused by pneumatic tools, punch presses, steam valves, explosions, etc.) can instantaneously raise ambient noise levels to very high SPLs.

The dynamic range of a sound level meter is defined as a measure of the dB ratio between the largest and smallest measurable signal

within a *single* range setting. Dynamic range is a key indication of the ability of an instrument to accurately respond to any changes in noise levels, regardless how impulsive the noise.

Competitive sound level meters often offer a smaller dynamic range than the **710** and employ either range switches or autoranging circuits in attempting to span the typical range of sound level measurements. However, autorange circuits are not adequate to accurately measure many types of noise impulses.

The **710** provides a full 110 dB dynamic range, which eliminates the need for range switches and prevents the loss or inaccurate measurement of data due to overload, under-range, or autorange errors.

The dynamic impulse response is so advanced that the energy of a single 1 msec pulse can be accurately captured.

In addition to the integrating rms detector, a separate Linear Peak Detector circuit with 40 dB dynamic range (nominally 113 to 153 dB) is provided, to make detailed analysis of impulsive exposure possible.

Because these features free the user from instrument accuracy concerns, more attention can be given to the meaning of the data acquired. There is no need to settle for instruments with limitations when the **Model 710** guarantees superb measurement accuracy for any type of noise.

Printer/Computer Interface

The **710** has an RS-232 port which allows downloading to a serial printer for a neatly formatted one-page report or to a computer for data filing and customized reporting.

Customized Features

Embedded in the memory of each meter is the company name, the meter serial number, calibration offset, and the software revision level. These are printed on all reports to identify product ownership and to deter theft or product misuse. Additional custom features are available including change of standard param-

eter settings at time of purchase. See the parameter selection sheet for more information.

Data Security

The 710 keyboard can be locked by pushing the LOCK key and entering 4 numbers. The keyboard will be inoperative until these same few numbers are again entered.

Selection Of Dose 1 And Dose 2 Parameters

The exchange rate, criteria level, and threshold values for Dose, TWA, and Threshold are given default settings at the factory. However, these settings can be changed from the 710 keyboard or from a computer.

Time History

The **Model 710** has the capability to store and print several thousand time history samples. Dual histogram tables showing distributed rms energy and distributed peak energy (impulses) above 120 dB are standard.

Report compression features allow the user to compress the data history to 15, 30, 60 or 480 sample time intervals. One special print mode allows the **710** to compress the time history data, regardless of the number of samples, to a single page report.

Model 810 Type 1 SLM

The **Model 810** is a precision, Type 1, integrating sound level meter and noise dosimeter. It retains all the functions of the Model **710** but has a Type 1 frequency response. The standard configuration includes a 5 inch preamplifier (Model 827), and a 1/2 inch precision air condenser microphone. Optional high sensitivity or dosimeter versions are available.

Model 710 Specifications

Acoustical and Electrical

Dynamic Range

110 dB min., 35 to 145 dBA (typical) in one range

Crest Factor

40 dB (based on 1 sec rms integration)

Pulse Range

80 dB min. using 1 msec burst of 4 kHz

Single Pulse Response

less than 1.5 dB error for a single cycle of 1 kHz at 140 dB

Noise Floors

35 dB max. A-weight slow 105 to 114 dB unweighted peak

Frequency Response

A-weight meets ANSI S1.4 1983

Unweighted Peak Detector

11 Hz to 10 kHz

Detector Accuracy

True rms, less than 0.4 dB error from 40 to 140 dB

Display

Custom 16 element LCD 0.1 dB, 0.1% resolution

Power Supply

9 V Alkaline Battery Dura-cell MN1604 or equivalent

External Supply: 7 to 16 Vdc at 18 mA max.

Operating Time

40 hr continuous, 3 mo. memory retention

Standards Met

ANSI S1.25 1978 Type 2

ANSI S1.4 1983 Type 2

IEC 651 Type 2

IEC 804 Type 2

Environmental

Effect of Humidity

Less than 0.5 dB error with 90% humidity at 25° C (72° F)

Effect of Temperature

Less than 0.5 dB error from -20° to 50° C

Storage Temperature Range

-30° to 60° C

Effect of Magnetic Fields

47 dB (A or C weight)

80 A/M (1 Oersted) and 67 dBA

800 A/M (10 Oersted)

Memory Saturation

Elapsed Time

19.4 days

Dose

19999%

TWA

limited to 19.4 days

Projected Dose

9999%

Number of Overloads

255

Number of Stops

255

Overload Level

145 dB min.

SPL

140 dB min.

Peak

145 dB min.

Physical

Dimensions

Width: 7.5 cm (3 in)

Length: 15.0 cm (6 in)

Depth: 2.5 cm (1 in)

Weight

326 g (11.5 oz.)

Model 810 Specifications

Acoustical and Electrical

Dynamic Range

110 dB min., 20 to 130 dBA (typical) in one range

Crest Factor

40 dB (based on 1 sec rms integration)

Pulse Range

80 dB min. using 1 msec burst of 4 kHz

Single Pulse Response

less than 1.5 dB error for a single cycle of 1 kHz at 140 dB

Noise Floors

35 dB max. A-weight slow 105 to 114 dB unweighted peak

Frequency Response

A-weight meets ANSI S1.4 1983

Unweighted Peak Detector

11 Hz to 10 kHz

Detector Accuracy

True rms, less than 0.4 dB error from 40 to 140 dB

Display

Custom 16 element LCD 0.1 dB, 0.1% resolution

Power Supply

9 V Alkaline Battery Duracell MN1604 or equivalent

External Supply: 7 to 16 Vdc at 18 mA max.

Operating Time

40 hr continuous, 3 mo. memory retention

Standards Met

ANSI S1.25 1978 Type 1

ANSI S1.4 1983 Type 1

IEC 651 Type 1

IEC 804 Type 1

Environmental

Effect of Humidity

Less than 0.5 dB error with 90% humidity at 25° C (72° F)

Effect of Temperature

Less than 0.5 dB error from -20° to 50° C

Storage Temperature Range

-30° to 60° C

Effect of Magnetic Fields

47 dB (A or C weight)

80 A/M (1 Oersted) and 67 dBA

800 A/M (10 Oersted)

Memory Saturation

Elapsed Time

19.4 days

Dose

19999%

TWA

limited to 19.4 days

Projected Dose

9999%

Number of Overloads

255

Number of Stops

255

Overload Level

145 dB min.

SPL

140 dB min.

Peak

145 dB min.

Physical

Dimensions

Width: 7.5 cm (3 in)

Length: 32.4 cm (13 in)

Depth: 2.5 cm (1 in)

Weight

454 g (16 oz.)

MODEL 710 DOSIMETER/SOUND LEVEL METER

38.9 % DOSE 2		**RUN 78.3 %** PROJ DOSE
64.5 % PROJ DOSE 1	**RUN 78.3 dBA** TWA2	**OVLD 0**
Prn1 1	LARSON·DAVIS MODEL 710	**10:26 M.S**
72.9 dBA TWA1	PROJ1 7 DOSE1 — PROJ2 8 DOSE2 — OVLD 9 TIME	**SEL 104.6 dBA**
MIN 38.9 dBA	PRN 1 4 TWA 1 — PRN 2 5 TWA 2 — SEL 6 LEQ	**RUN 78.3 LEQ dBA**
RUN MAX 126.4 dBA	LMIN 1 LMAX — UWPK 2 SLM — LOCK 3 BATT	**RUN 80 %** BATTERY
126.4 UWPK	SHIFT — RESET 0 R/S — OFF ← ON	**OFF**
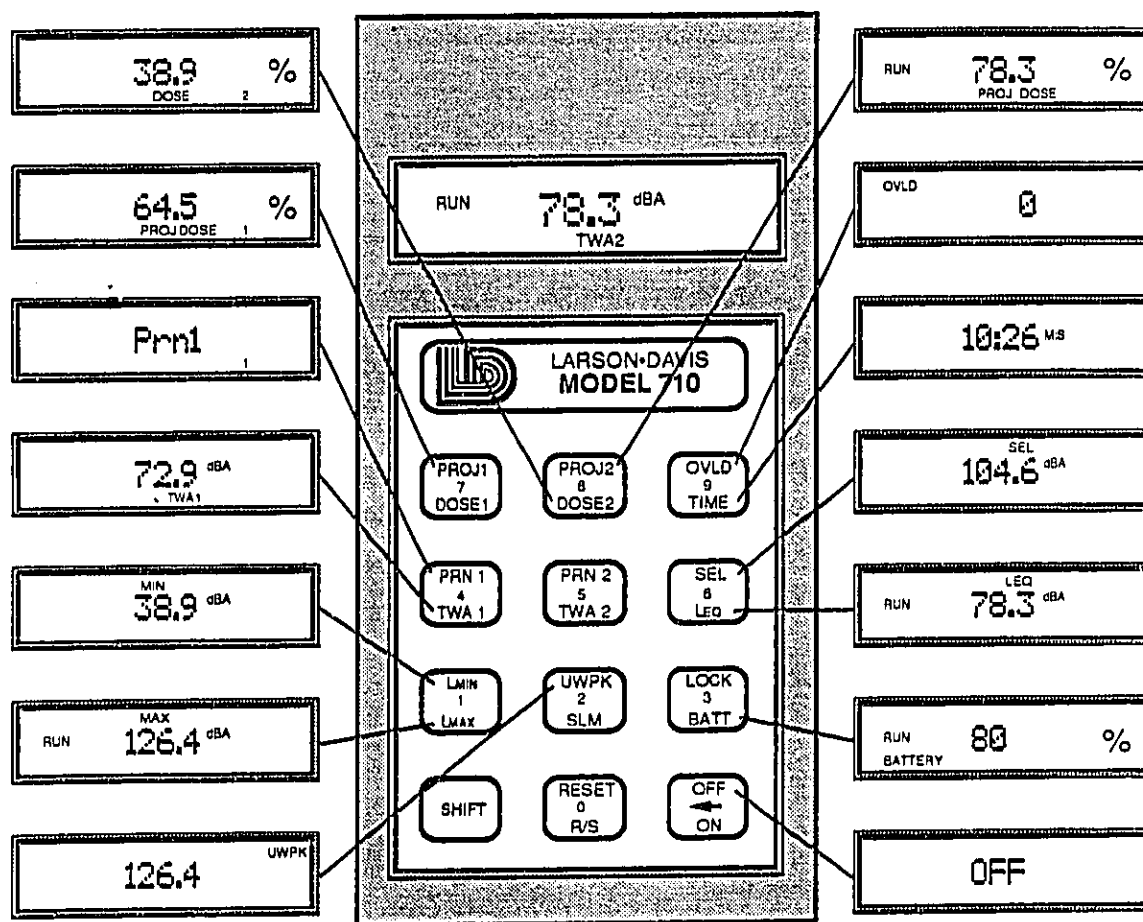
*Examples of the highly descriptive data
displays of the model 710*

Model 710/810 Customer Specified Parameters

Certain parameters of the 710 must be specified at time of purchase. They are resident in EPROMs and will be reverted to in case of MEMORY LOSS, such as when the meter is left overnight without a battery. Please complete this form and return it to Larson•Davis Laboratories with your order.

P.O. Number: _____   LDL Order Number: _____

Name: _____   Company:_____

Address: _____

City: _____   State/Province, Country _____

Customer Name (Maximum of 30 Characters including spaces, will appear on printouts)

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Peak Saved in Time History[1]   Yes (default) _____   No _____

Peak Distribution[2]   Ten entries/sec (default) _____   One entry/sec _____

Data Reset in[3]   1 second _____   2 seconds (default) _____

Dose and other Parameters

Defaults are for U.S.A. OSHA doses and minute by minute Leq time history.

DOSE 1		Default	
A,.	Exchange Rate #1 (3,4,5,6)	5	_____
B	Threshold #1	90	_____
C	Criterion #1	90	_____
DOSE 2			
D	Exchange Rate #2 (3,4,5,6)	5	_____
E	Threshold #2	80	_____
F	Criterion #2	90	_____
G	Leq Exchange Rate	3	_____
H	Leq Threshold	0	_____
I	Leq Criterion (not used)	0	_____
J	RMS Exceedance Level	115	_____
K	Peak Exceedance Level	140	_____
L	Exceedance Hysteresis (0-7)	2	_____
M	History Period (n x 10 sec., n=1 to 255)	6	_____
N	History Exchange Rate (3,4,5,6)	3	_____
O	History Threshold	0	_____

All values must be whole numbers. Parameters A-F and J-L can be modified from the keypad.

---

[1] If yes, the highest peak value for each history period is also stored with the time history point.
[2] This specifies the sampling rate of the peak hold detector used for the peak level histogram.
[3] Time required to reset the memory by holding 2 keys simultaneously.

LARSON•DAVIS

710DUMP SOFTWARE FOR THE MODEL 710C

The powerful measurement capabilities of the Larson-Davis Model 710C can now be exploited to their fullest extent with a simple software package which lends itself to casual use as well as to software development.

With the 700-C10C interface cable, the memory and set-up registers of the sound level meter are accessible from a PC compatible at a rate of 1200 baud. The Larson-Davis 710DUMP Program will extract the data out of the Model 710 with very little difficulty, eliminating the task of programming communication routines. Some of the features of the software are:

•   Direct print of usual 710C reports to file
•   Data dump of histogram or time history to files which can be imported into spreadsheets.
•   Commands may be called from batch files with no screen echo.
•   Parameters for dose, time history duration, etc may be changed from the PC.

This last feature lets the user modify the history L_{eq} period anywhere from 1 second to n times 10 seconds (n=1 to 255). This turns the 710 into a limited environmental noise monitor, with variable interval L_{eq} up to more than 40 minutes and overall histogram.

This program does not analyze or display the data graphically. The Larson•Davis Laboratories 710-SW1 Software allows such manipulation. Contact Larson-Davis for more information.
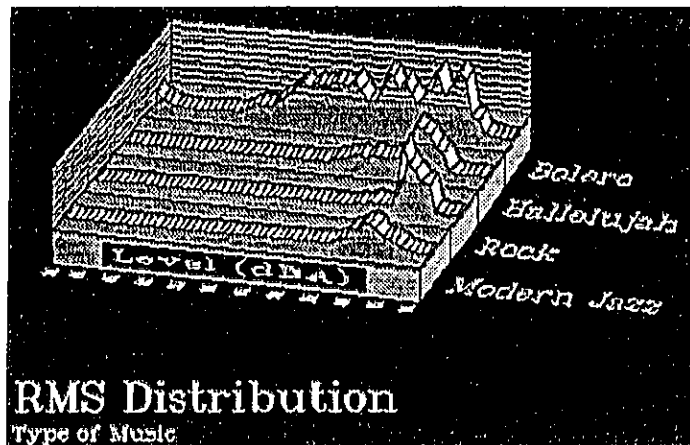
Sample graph created with FOXGRAPH (TM) using 710DUMP of RMS histogram data for different types of music.

INSTRUCTIONS

These instructions can be viewed be entering **TYPE 710DUMP.DOC |MORE** at a DOS prompt. Other sample files with the extension *.DOC may be viewed.

Before starting the program, connect the 710C to your computer's COM1 RS-232 port with a Model 700-C10C interface cable. RS-232 communication requires much battery power from the 710C. We suggest the use of the external power jack and AC\DC-1 or 2 adapter on the interface cable. This will also power the 710C externally and minimizes battery drain.

710DUMP is activated by typing (at the DOS prompt) the command: **710DUMP**
The computer screen will clear and then show the following:

```
Larson·Davis Model 710                    Data to File Transfer Program
```

```
Command line options are:                          Output File Name:
  P1           for User 1 Report . . . . . . . . . . . 710USER1.DAT
  P20 to P29 for User 2 Reports   . . . . . . . . . . 710USER2.DAT
  P2           for RMS Histogram Data File  . . . . . . 710RMS.DAT
  P3           for Peak Histogram Data File . . . . . . 710PEAK.DAT
  P4           for Time History Data File . . . . . . . 710HIST.DAT
  P5           for all 'R' & 'Q' values File . . . . . 710READ.DAT
  A            for All unformatted files i.e. P2-P5
  Q            will quiet any output to the screen
  E            to Enter new parameters into 710
```

Any combination of P2 to P5 may be issued for multiple files at one time.
For example: '**710DUMP P4 P5 Q**' will read the overall and history data without printing anything to the screen.

Command line:
(c) Copyright 1989 Larson-Davis

Note: This program utilizes the colors of a CGA monitor or equivalent; on a Monochrome Monitor the program may not operate properly.

The commands for the 710DUMP program may also be included on the command line. This allows 710DUMP to operate from a DOS BATCH command file. The following line is an example of a command line that will extract the USER 2 report 0 from the 710:

710DUMP P20 Q

The report will be extracted from the 710 and placed in a file called
710USER2.DAT and the "Q" command will keep the 710DUMP from changing the screen mode or printing anything to the CRT (this will work with MONOCHROME MONITORS).