BrainMaster™ System
Type 2E Module & Software for Windows™

Review Screens

"Breview.exe"

BrainMaster System
Review Screens ("Breview.exe")

1.1 Introduction

This manual describes the use of the session summary and review screens for the BrainMaster system. This program is **"BReview.exe,"** and it interfaces to the system by reading the standard files written into the directory \brainm.20\studies\[userid]. The programming and file interfaces are documented, to facilitate the development of user-developed and third-party software and applications.

1.2 The Session File

The BrainMaster automatically maintains "Summary" files in the current directory. This file contains a textual summary of the EEG component values, their means, and standard deviations for 1-minute intervals, or whenever data collection is started and stopped. This file contains time-stamps with each record. In addition, when any of the number keys (1 through 9) are pressed, the file posts the exact time and date, and records the number. This allows the user to save time-markers for important events. By making a standard use of the numbered markers, up to 9 different types of events can be accurately time-logged.

This file is restarted each time the Training Screen is run. These files are named e.g. "sum00001.bsm," "sum00002.bsm," and so on.

An example of a session file is included in a later section of this manual.

1.3 Starting the Review Program

In order to view the session files written out by the system, do the following:

Using the BrainMaster "Bsetup" program, click on the button labeled "Review Session Results" that is on the main Bsetup Home Screen:
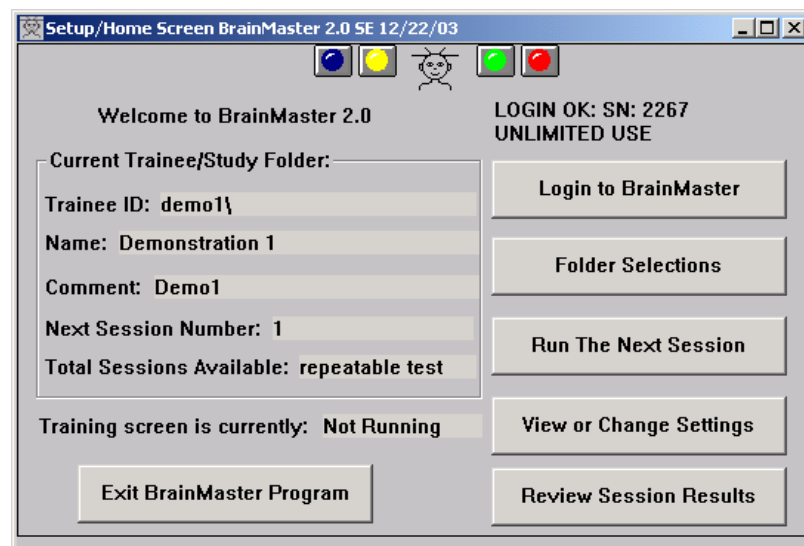
It is also possible to start breview by double-clicking one one of the session files the directory \brainm.20\studies[trainee_id] in Windows (using, e.g. "My Computer" or "Windows Explorer").

This will start Breview, and automatically load the referenced file, as shown in the example below:
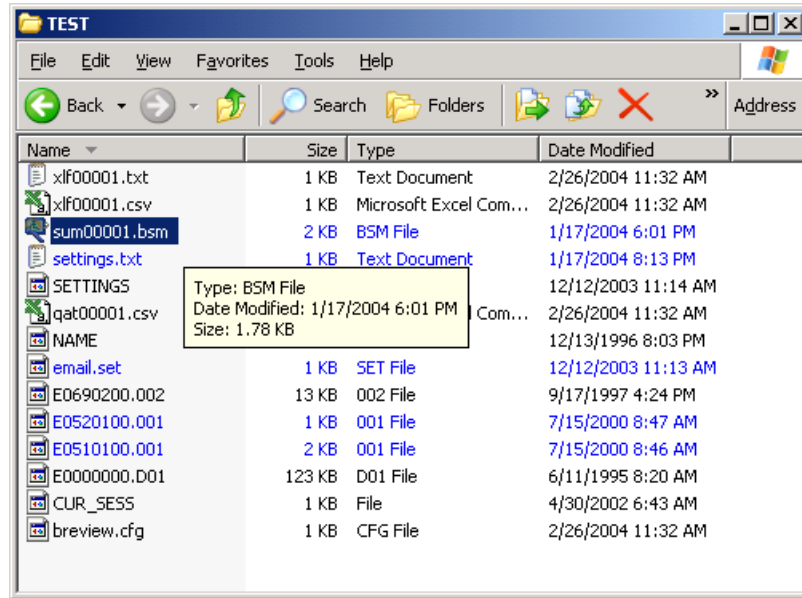
The Review screen will appear. If a current session and current study are defined by the system, that session will appear on the screen. If there is a current study but not a current session, Breview will default to displaying all sessions.

1.4 Viewing All Sessions

The BReview screen should be visible. It will automatically load the latest, or the current seession, from the current trainee (the last one selected). You may press **"Show All"** to display a bargraph summary of all sessions for the current user. The display format will depend upon the current settings as described below.

1.4.1 All sessions by Session
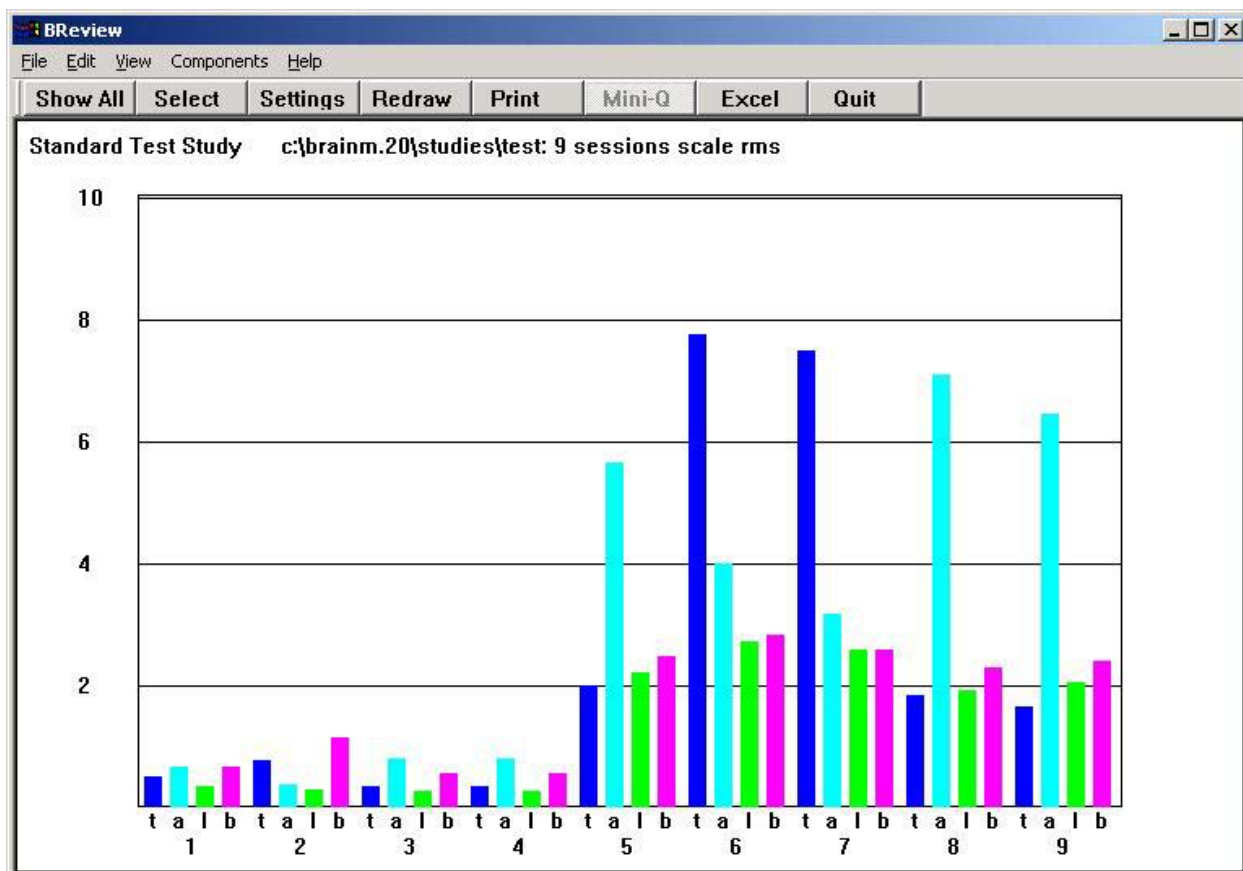
The screen display above shows all sessions plotted by session.

The system looks for the sessions in order, starting with session 1, and continuing until a session is not found. Therefore, **it is necessary to have all sessions in order, starting with session 1**, for this display to show the sessions properly. Sessions are normally automatically numbered by the "Master.exe" program.

In the current release, the four components initially shown are theta, alpha, low beta, and beta, and are labeled "t", "a", "l", and "b". These are the most common EEG components used for training, and new studies will default to this selection.. It is possible to view the other components (delta, hi beta, gamma, or user) by means of the 'settings' screen, which is described in further detail below.

If you press the Print button, the printer will print out a set of bar graphs, the same as are shown on the display. Printing will usually default to "portrait" mode. If you prefer a "landscape" (horizontal) rather than a "portrait" (vertical) mode printout, you will need to select this option in your printer settings, using the Windows printer control panel that appears when you request your printout. These are different for every printer, but the selection should always be available in one of the control tabs in your printer control.

1.4.2 All Sessions by Type

If the current settings have been modified to show all sessions by type, the following display format will result:
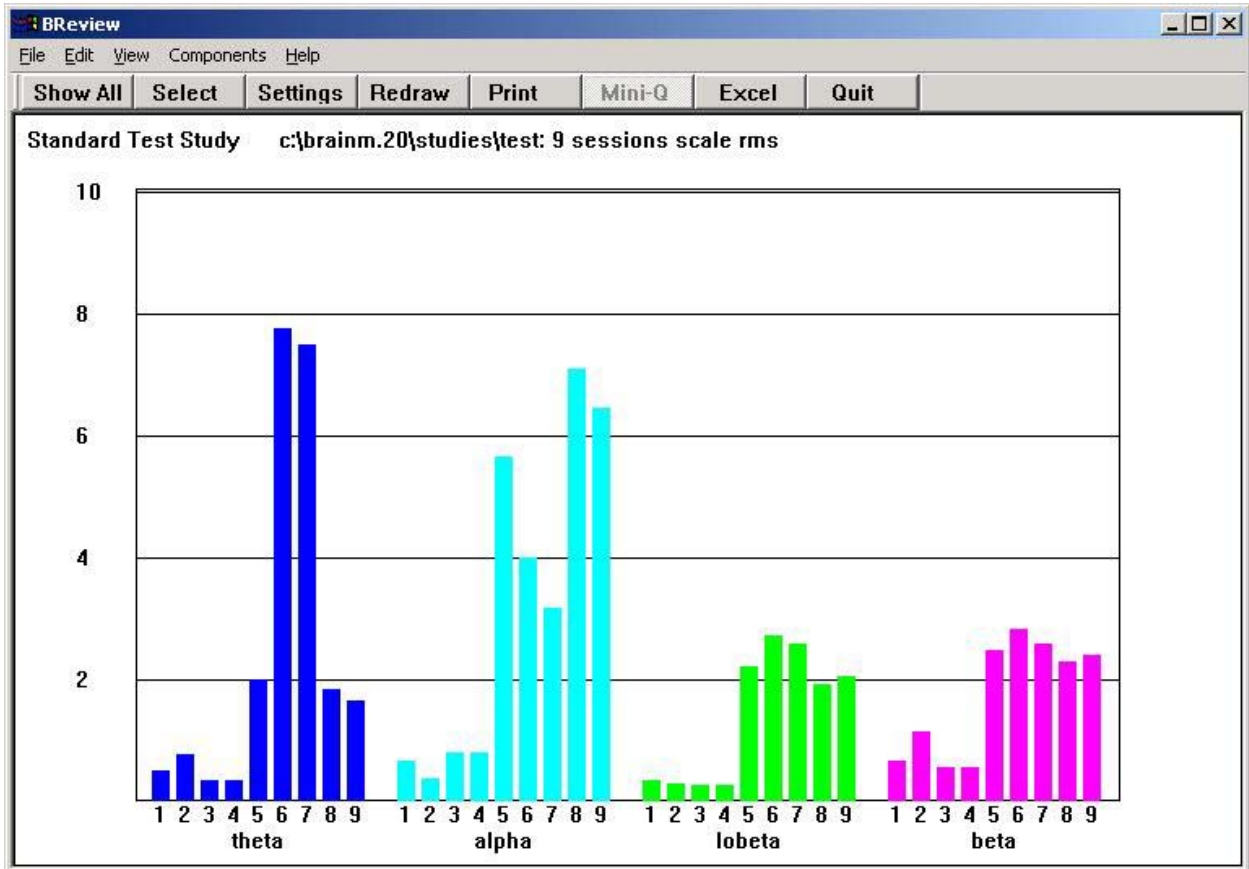
1.5 Selecting a Session

Press **"Select Session"** to get a popup box to select the trainee or session to be reviewed.
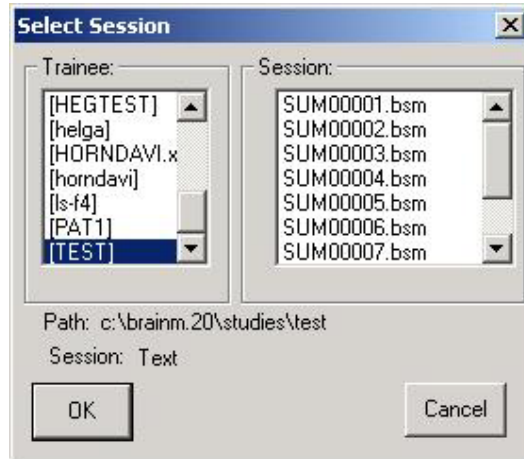
If you select only a trainee from this popup, then press "OK", it will display all sessions for that trainee. If you select a session, it will display the session data. Once you have selected a trainee and session to view, and returned to the main screen, you can still press "All Sessions" to view all sessions for that trainee.
Selecting a trainee for viewing in this manner does NOT change the "current trainee" for the BrainMaster training system to that user. Thus, it is possible to use the review program to review any trainees, without changing the current trainee for the use of the master training program.

1.6 Changing Settings

The Settings button brings up the Settings dialog that allows you to change the display settings for the review display:
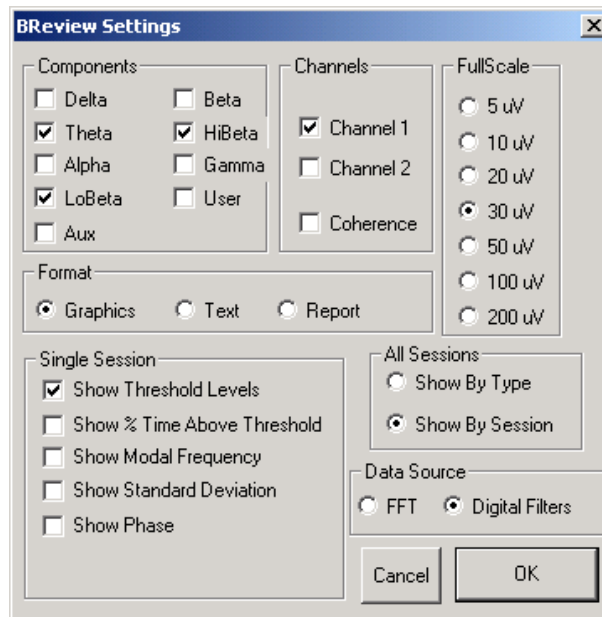
This dialog allows you to select the following:

- Components to be viewed
- Channels to be viewed (and coherence if 2-channel data)
- Variables (threshold, percent time, modal frequency, standard deviation, phase) to be viewed
- Full Scale display range in microvolts (or percent if FFT, percent time, coherence, phase, Hz if frequency)
- Format (graphics, text, or report)
- All Sessions format (by type, or by session)
- Data source: FFT (Fast Fourier Transform) or Digital Filters.

Note that FFT data are presented as percent of total energy in the EEG.
Digital Filter data are presented as microvolts of amplitude.
To ensure the correct interpretation when using percent or Hz data, set the FullScale range to 100 before reading values from graphs.

1.7 Reviewing a Session

When you select a single session, it will appear on the review screen. When you press "OK", the select box will go away, and the session data will be visible.

1.7.1 Single Session Graphical Display
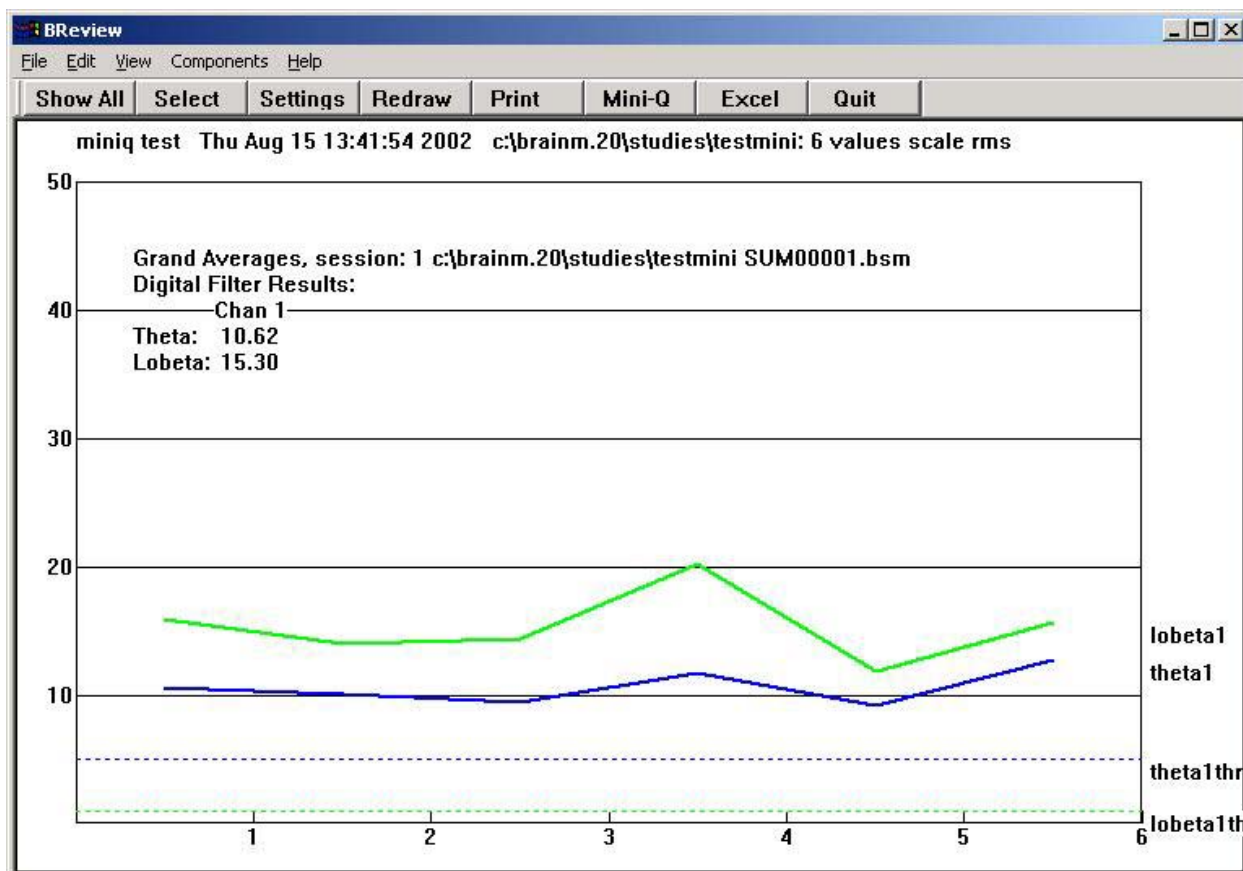
If you press the "**Print**" button, the printer will print out a set of line graphs, the same as are shown on the display.

As with the **"All Sessions"** screen, only the four components, theta, alpha, low beta, and beta are currently shown by default. Other components may be selected by means of the 'settings' button.

If you wish to view the data in more detail, , you may use the **Excel File Import** function described in a following section, to display or process any of the session data in any way you desire.

NOTE: **It is recommended that any study have no more than 80 sessions**, in order to make it easier to manage the data.   If any study will have more than 80 sessions, you should create another trainee ID to accommodate the additional session data.

1.7.2 Single Session with Thresholds

It is possible to display the thresholds, and how they change with time by selecting 'Show Threshold Levels' in the settings screen. An example is shown here:
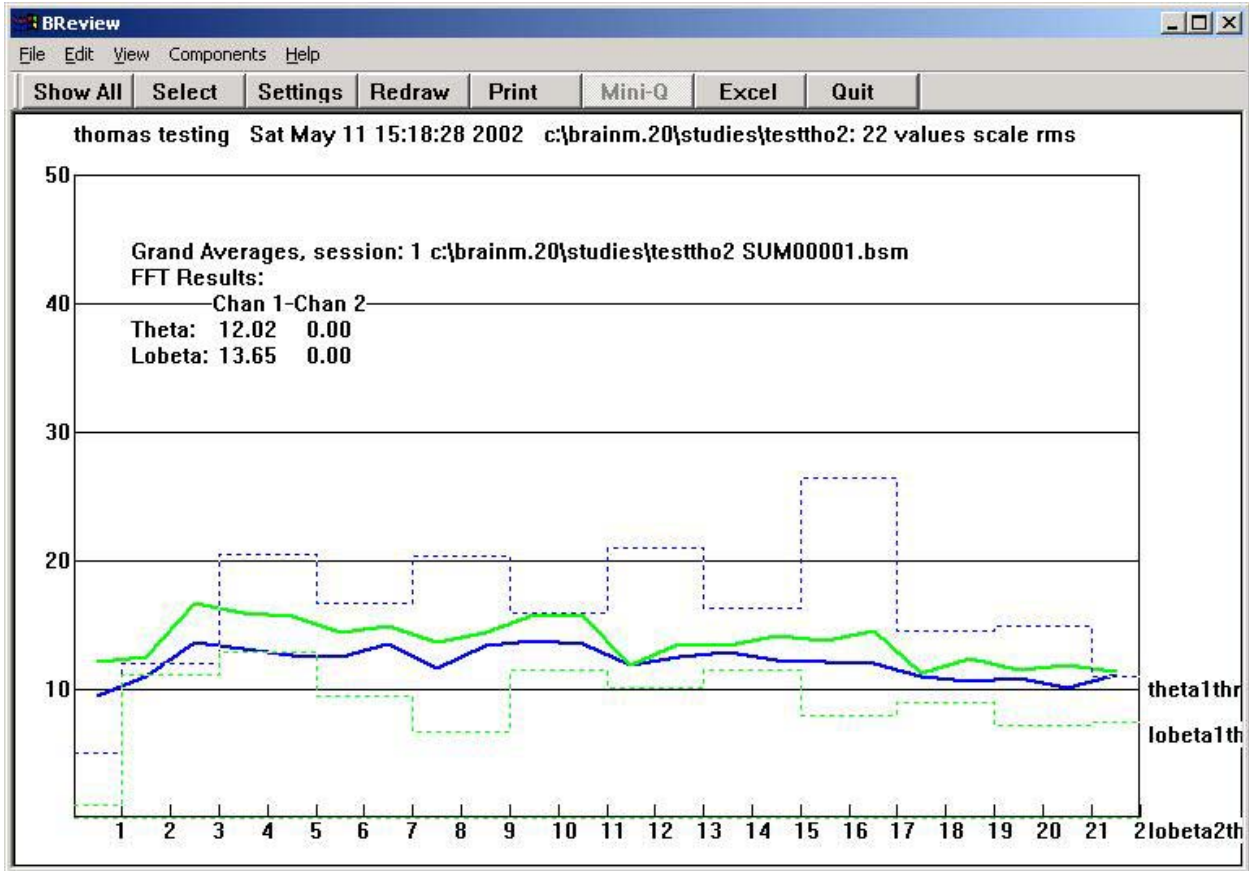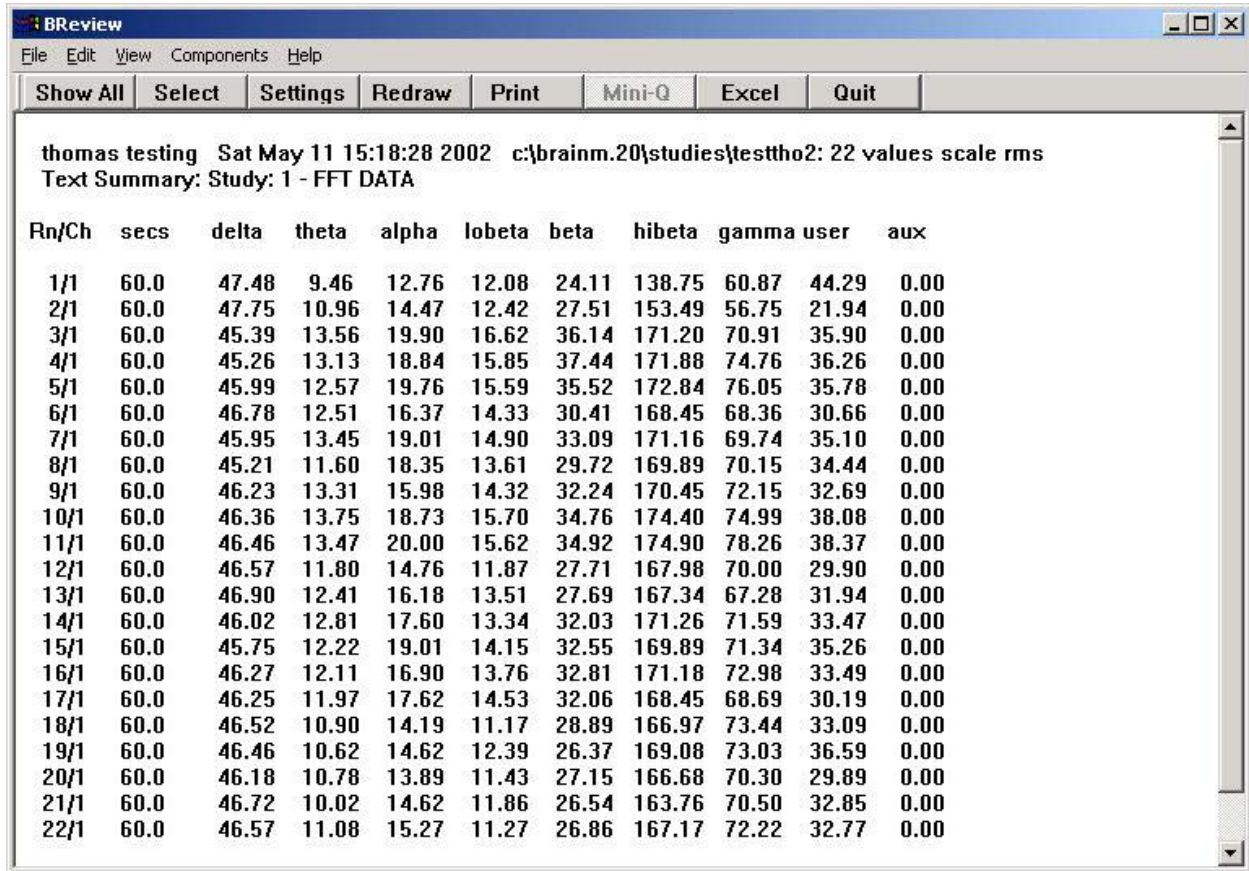
1.7.3 Single Session with Percent Over Threshold

It is also possible to display the percentage time above threshold for each 60 second time period. In the following example, both the threshold levels and the percentage of time above threshold are being displayed.
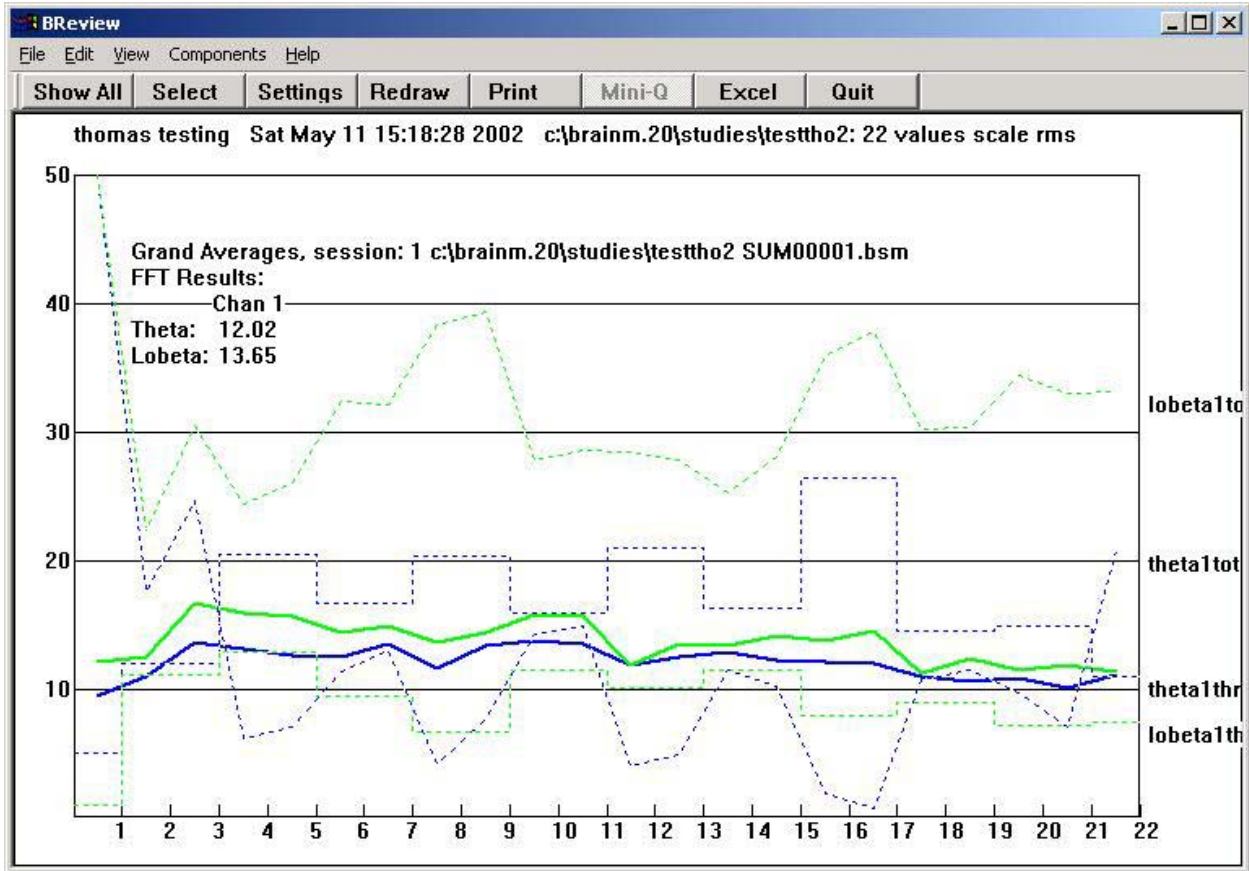
1.7.4 Single session Text Format

The single session display format may be set to 'text' my means of the Settings button. An example is shown below.

```
BReview                                                                    _ □ ×
File  Edit  View  Components  Help

  Show All  │  Select  │  Settings  │  Redraw  │  Print  │  Mini-Q  │  Excel  │  Quit

  thomas testing   Sat May 11 15:18:28 2002   c:\brainm.20\studies\testtho2: 22 values scale rms
  Text Summary: Study: 1 - FFT DATA

  Rn/Ch   secs   delta   theta   alpha  lobeta  beta   hibeta  gamma user    aux

    1/1    60.0   47.48    9.46   12.76   12.08  24.11  138.75  60.87   44.29   0.00
    2/1    60.0   47.75   10.96   14.47   12.42  27.51  153.49  56.75   21.94   0.00
    3/1    60.0   45.39   13.56   19.90   16.62  36.14  171.20  70.91   35.90   0.00
    4/1    60.0   45.26   13.13   18.84   15.85  37.44  171.88  74.76   36.26   0.00
    5/1    60.0   45.99   12.57   19.76   15.59  35.52  172.84  76.05   35.78   0.00
    6/1    60.0   46.78   12.51   16.37   14.33  30.41  168.45  68.36   30.66   0.00
    7/1    60.0   45.95   13.45   19.01   14.90  33.09  171.16  69.74   35.10   0.00
    8/1    60.0   45.21   11.60   18.35   13.61  29.72  169.89  70.15   34.44   0.00
    9/1    60.0   46.23   13.31   15.98   14.32  32.24  170.45  72.15   32.69   0.00
   10/1    60.0   46.36   13.75   18.73   15.70  34.76  174.40  74.99   38.08   0.00
   11/1    60.0   46.46   13.47   20.00   15.62  34.92  174.90  78.26   38.37   0.00
   12/1    60.0   46.57   11.80   14.76   11.87  27.71  167.98  70.00   29.90   0.00
   13/1    60.0   46.90   12.41   16.18   13.51  27.69  167.34  67.28   31.94   0.00
   14/1    60.0   46.02   12.81   17.60   13.34  32.03  171.26  71.59   33.47   0.00
   15/1    60.0   45.75   12.22   19.01   14.15  32.55  169.89  71.34   35.26   0.00
   16/1    60.0   46.27   12.11   16.90   13.76  32.81  171.18  72.98   33.49   0.00
   17/1    60.0   46.25   11.97   17.62   14.53  32.06  168.45  68.69   30.19   0.00
   18/1    60.0   46.52   10.90   14.19   11.17  28.89  166.97  73.44   33.09   0.00
   19/1    60.0   46.46   10.62   14.62   12.39  26.37  169.08  73.03   36.59   0.00
   20/1    60.0   46.18   10.78   13.89   11.43  27.15  166.68  70.30   29.89   0.00
   21/1    60.0   46.72   10.02   14.62   11.86  26.54  163.76  70.50   32.85   0.00
   22/1    60.0   46.57   11.08   15.27   11.27  26.86  167.17  72.22   32.77   0.00
```

1.7.5 Single Session Report Format

The single session display format may be set to 'report' by means of the Settings button. An example is shown below.

```
BReview                                                          _ □ ×
File  Edit  View  Components  Help

Show All │ Select │ Settings │ Redraw │ Print │ Mini-Q │ Excel │ Quit

Summary Report: Study: 1 - Session Summary Report
File: c:\brainm.20\studies\testtho2\report.txt

Demographic Information:
   Trainee Name:      thomas testing
   Date:              Sat May 11 15:18:28 2002
   Clinician ID:

Settings:
   Number of channels:     1
   GO:                     lobeta (1.0)
   STOP:                   theta (5.0) hibeta (8.0)
   Filter settings:
        delta:   1.0 -3.0    theta:   4.0 -7.0    alpha:   8.0 -12.0
        lobeta:  12.0-15.0   beta:    15.0-20.0   hibeta:  20.0-30.0
        gamma:   38.0-42.0   user:    30.0-35.0   aux:     0.0 -0.0
   Artifact threshold:     240 uV
   Number of runs:         10
   Run length:             120

Results:
   Duration of session:                    1320 seconds = 22 minutes 0 seconds
   Total points:                           834
   Points per minute:                      37.9
   Total % time over threshold (percent of time):
        delta    theta    alpha    lobeta   beta     hibeta   gamma user     aux
        104.77   25.20    104.77   65.69    104.77   32.59    104.18 104.77   0.00
   Total artifact time:                    0
   % time artifact:                        0.00
   Starting Baseline (microvolts):
        delta    theta    alpha    lobeta   beta     hibeta   gamma user     aux
        37.87    8.47     12.43    9.28     76.95    84.84    116.78 26.80    0.00
   Ending Baseline (microvolts):
        delta    theta    alpha    lobeta   beta     hibeta   gamma user     aux
        37.87    8.47     12.43    9.28     76.95    84.84    116.78 26.80    0.00
   Starting Thresholds (microvolts):
        delta    theta    alpha    lobeta   beta     hibeta   gamma user     aux
        0.00     5.00     0.00     1.00     0.00     8.00     0.00   0.00     0.00
   Ending Thresholds (microvolts):
        delta    theta    alpha    lobeta   beta     hibeta   gamma user     aux
        0.00     10.90    0.00     7.40     0.00     84.40    0.00   0.00     0.00
   Grand Means (Digital Filter) - (microvolts):
        delta    theta    alpha    lobeta   beta     hibeta   gamma user     aux
        39.17    11.26    14.03    13.15    91.47    82.38    139.28 24.58    0.00
   Grand Percentages (from FFT) - (percent of energy):
        delta    theta    alpha    lobeta   beta     hibeta   gamma user     aux
        46.32    12.02    16.76    13.65    30.75    167.60   70.65  33.77    0.00
```

1.8 Excel File Import

1.8.1 File import procedure

Session data can be read into Excel by selecting the "Quick-File" or the "Excel Table" button at the top of the screen while viewing the session of interest.

NOTE: You must have Microsoft Excel (trademark of Microsoft Corporation) or equivalent software installed on your PC for this feature to work.

When you select one of the Excel options, the system will automatically load the data into Excel, and open a spreadsheet for you to work from.

Excel files have columns and rows. The columns are used to contain the various data for the component bands (delta, theta, etc), and the rows are used to contain the data from successive runs.

Column headings contain labels that identify the type of data contained in that column.

Each record has an entry for the Run number of the respective data ("RUN"). The column NPTS indicates the number of points (seconds) contained in the row's average data. The entries E1 through E5 show the electrode names as entered into the program. When a MINI-Q headbox is used, these are automatically filled in with the correct electrode labels, based on the MINI-Q switch position.

NOTE: The Report, as well as the spreadsheet outputs, will also show any timestamped Notes that you create. You can create a Note at any time, by pressing one of the numeric keys 3, 4, 5, 6, 7, 8, or 9, during a session. The Note will show the exact time and date of the note, and which key was pressed. This can be used to record important time information, by using a convention of your choosing, for the meaning of the key presses. For example, the following convention might be used:

Key Pressed	Note Interpretation
3	Eyes Open
4	Eyes Closed
5	Performing Task
6	Eyes Moving
7	Talking
8	Resting
9	Moving

In the 2.0SE release, the notes can be viewed in the Report output, or on the Excel spreadsheets.

1.8.2 Excel Table example

Shown below is an image of the resulting excel spreadsheet with the labeled fields for the session data. You may now use excel to access any of the data values, plot them, calculate statistics, etc. As shown in the example below, the values for all 8 EEG components are available, and both the "AVG" (average or mean) and "STD" (standard deviation) are available. Values are stored in columns, one for each "run" where a run is 1 minute of the session.

Microsoft Excel - xlf00001.csv

A1 = c:\brainm.20\studies\BMIRROR2\xlf00001.csv

c:\brainm.20\studies\BMIRROR2\xlf00001.csv
c:\brainm.20\studies\BMIRROR2\SUM00001.bsm

RUN	NPTS	E1	E2	E3	E4	E5	DELTAVG	THETAVG	ALPHAVG	LOBAVG	BETAVG	HIBAVG	GAMAVG	USRAVG	AUXAVG	DELTAVG	THETAVG	ALPHAVG
1	60	A1	C3	Cz	C4	A2	4.86	2.06	2.2	1.06	1.11	1.37	1.25	1.08	0	3.05	1.21	0.93
2	60	A1	C3	Cz	C4	A2	3.51	0.71	0.54	0.33	0.32	0.51	0.76	0.41	0	2.42	0.38	0.22
3	60	A1	C3	Cz	C4	A2	3.57	0.68	0.6	0.35	0.36	0.69	0.84	0.31	0	2.4	0.3	0.26
4	60	A1	C3	Cz	C4	A2	3.57	0.65	0.63	0.44	0.31	0.81	0.82	0.46	0	2.41	0.4	0.27
5	60	A1	C3	Cz	C4	A2	3.4	0.69	0.54	0.34	0.35	0.63	0.89	0.37	0	2.44	0.24	0.17
6	60	A1	C3	Cz	C4	A2	3.53	0.78	0.57	0.3	0.26	0.61	0.8	0.48	0	2.42	0.32	0.28
7	60	A1	C3	Cz	C4	A2	3.47	0.59	0.62	0.23	0.26	0.7	0.76	0.41	0	2.49	0.27	0.3
8	60	A1	C3	Cz	C4	A2	3.46	0.63	0.57	0.32	0.29	0.95	0.69	0.4	0	2.37	0.33	0.14
9	60	A1	C3	Cz	C4	A2	3.48	0.64	0.59	0.36	0.4	0.52	0.78	0.33	0	2.39	0.26	0.26
10	60	A1	C3	Cz	C4	A2	3.47	0.64	0.51	0.26	0.26	0.68	0.77	0.32	0	2.35	0.31	0.22
11	60	A1	C3	Cz	C4	A2	3.42	0.57	0.51	0.34	0.31	0.96	0.84	0.34	0	2.38	0.33	0.23
12	60	A1	C3	Cz	C4	A2	3.36	0.68	0.53	0.44	0.19	0.65	0.82	0.38	0	2.34	0.4	0.39
13	60	A1	C3	Cz	C4	A2	3.4	0.75	0.62	0.37	0.28	0.76	0.84	0.29	0	2.44	0.33	0.34
14	60	A1	C3	Cz	C4	A2	3.28	0.55	0.51	0.25	0.28	0.6	0.83	0.32	0	2.5	0.28	0.34
15	60	A1	C3	Cz	C4	A2	3.27	0.5	0.53	0.32	0.32	0.86	0.81	0.46	0	2.48	0.3	0.37
16	60	A1	C3	Cz	C4	A2	3.51	0.73	0.51	0.37	0.2	0.89	0.84	0.41	0	2.33	0.27	0.24
17	60	A1	C3	Cz	C4	A2	3.32	0.71	0.46	0.31	0.24	0.78	0.86	0.26	0	2.38	0.33	0.41
18	60	A1	C3	Cz	C4	A2	3.3	0.63	0.54	0.38	0.3	0.71	0.95	0.27	0	2.46	0.38	0.45
19	60	A1	C3	Cz	C4	A2	3.33	0.55	0.5	0.38	0.3	0.62	1.04	0.3	0	2.66	0.43	0.42
20	60	A1	C3	Cz	C4	A2	3.45	0.65	0.54	0.33	0.31	0.8	0.89	0.41	0	2.52	0.47	0.41
21	60	A1	C3	Cz	C4	A2	3.32	0.78	0.67	0.28	0.32	0.65	0.88	0.29	0	2.6	0.38	0.36
22	60	A1	C3	Cz	C4	A2	3.39	0.65	0.57	0.32	0.32	0.51	0.78	0.44	0	2.54	0.34	0.3
23	60	A1	C3	Cz	C4	A2	3.51	0.75	0.56	0.35	0.37	0.76	0.8	0.36	0	2.4	0.48	0.35
24	60	A1	C3	Cz	C4	A2	3.53	0.72	0.54	0.37	0.26	0.89	0.95	0.24	0	2.49	0.39	0.29
25	60	A1	C3	Cz	C4	A2	3.7	0.82	0.55	0.39	0.32	0.71	0.77	0.48	0	2.52	0.3	0.26
26	60	A1	C3	Cz	C4	A2	3.49	0.78	0.58	0.33	0.42	0.63	0.74	0.34	0	2.62	0.41	0.36
27	60	A1	C3	Cz	C4	A2	3.58	0.62	0.53	0.47	0.3	0.67	0.81	0.38	0	2.55	0.31	0.35
28	60	A1	C3	Cz	C4	A2	3.48	0.68	0.52	0.32	0.27	0.72	0.88	0.38	0	2.45	0.33	0.39
29	60	A1	C3	Cz	C4	A2	3.58	0.67	0.52	0.32	0.35	0.87	0.84	0.32	0	2.5	0.36	0.34
30	60	A1	C3	Cz	C4	A2	3.6	0.66	0.45	0.34	0.3	0.87	0.71	0.34	0	2.48	0.4	0.33
31	60	A1	C3	Cz	C4	A2	3.69	0.79	0.65	0.35	0.35	0.57	0.85	0.39	0	2.53	0.43	0.28
32	60	A1	C3	Cz	C4	A2	3.75	0.8	0.7	0.39	0.33	0.75	0.74	0.46	0	2.59	0.41	0.38
33	18	A1	C3	Cz	C4	A2	3.88	0.73	0.53	0.38	0.49	0.98	0.62	0.28	0	2.59	0.27	0.31

xlf00001

Ready

1.9 Quick-File (Mini-Q) File Example

You can also select the "Quick-File" option, which combines a wide variety of information in a tabular format, especially useful for mini-assessments, such as those done using the MINI-Q device.

The file can be automatically loaded into excel by selecting the Quick-File button at the top of the screen. An example is shown below:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	qat00001.csv																
2	c:\brainm.20\studies\konsasse\sum00001.bsm																
3	RUN	NPTS	SITE	TYPE	DELTA	THETA	ALPHA	LOBET	BETA	HIBET	GAMMA	USER	TH/AL	TH/LB	TH/BE	AL/BE	
4	1	60	F5	MEAN	55.16	37.11	13.04	6.72	10.2	10.37	4.11	7.36	2.85	5.52	3.64	1.28	
5	1	60	F5	MEANF	10.8	22.61	7.72	3.57	7.91	10.23	2.18	3	2.93	6.34	2.86	0.98	
6	1	60	F5	STDDEV	36.2	25.79	6.24	3.47	4.82	4.91	1.86	4.28	4.13	7.44	5.35	1.29	
7	1	60	F5	MODFRQ	1.76	4.72	9.51	13.32	18.77	29.85	39.93	10.87	0.5	0.35	0.25	0.51	
8	1	60	F6	MEAN	49.77	36.21	13.34	6.63	9.97	10.55	4.3	6.62	2.72	5.46	3.63	1.34	
9	1	60	F6	MEANF	10.81	23.44	8.27	3.47	8.32	11.06	2.55	2.98	2.83	6.76	2.82	0.99	
10	1	60	F6	STDDEV	32.07	22.86	6.56	3.49	4.76	5.32	1.74	3.43	3.48	6.56	4.8	1.38	
11	1	60	F6	MODFRQ	1.75	4.77	9.47	13.35	18.7	30.11	39.92	10.79	0.5	0.36	0.26	0.51	
12	1	60	F5-F6	COHE	95.48	82.52	66.37	47.8	32.72	24.68	21.12	56.1	1.24	1.73	2.52	2.03	
13	1	60	F5-F6	PHASE	7.88	12.22	18.98	26.63	33.85	36.92	37.78	22.4	0.64	0.46	0.36	0.56	
14	1	60	F5/F6	ASYM	1	0.96	0.93	1.03	0.95	0.93	0.85	1.01	1.03	0.94	1.02	0.98	
15	2	60	F5	MEAN	36.11	27.06	11.62	7.05	9.48	10.95	4.7	7.08	2.33	3.84	2.86	1.23	
16	2	60	F5	MEANF	8.59	20.19	7.63	3.66	9.13	13.29	2.64	2.97	2.65	5.52	2.21	0.84	
17	2	60	F5	STDDEV	26.88	17.95	5.22	3.41	3.11	5.08	2.11	4.51	3.44	5.27	5.78	1.68	
18	2	60	F5	MODFRQ	1.72	4.86	9.51	13.4	19.01	29.76	39.89	10.86	0.51	0.36	0.26	0.5	
19	2	60	F6	MEAN	31.01	28.35	11.79	6.53	7.55	8.91	4.11	7.37	2.4	4.34	3.75	1.56	
20	2	60	F6	MEANF	8.61	23.51	8.5	4.08	8.63	12.22	2.62	3.32	2.76	5.77	2.72	0.98	
21	2	60	F6	STDDEV	22.15	14.55	5.11	2.99	2.5	2.61	1.74	4.45	2.85	4.86	5.82	2.04	
22	2	60	F6	MODFRQ	1.67	5	9.46	13.36	18.76	30.17	39.83	10.87	0.53	0.37	0.27	0.5	
23	2	60	F5-F6	COHE	87.9	82.1	65.2	44.97	19.45	20.68	18.22	65.35	1.26	1.83	4.22	3.35	
24	2	60	F5-F6	PHASE	13.67	15.3	18.55	28.35	37.98	40.1	42.7	20.68	0.82	0.54	0.4	0.49	
25	2	60	F5/F6	ASYM	1	0.86	0.9	0.9	1.06	1.09	1.01	0.89	0.96	0.96	0.81	0.85	
26	3	2	F5	MEAN	20.7	31.1	16.15	10.55	20	24.15	10.85	5.85	1.93	2.95	1.55	0.81	
27	3	2	F5	MEANF	3.6	10.15	6.65	3.55	12.15	26.2	5.05	2.75	1.53	2.86	0.84	0.55	
28	3	2	F5	STDDEV	1.56	12.73	1.63	0.78	3.54	9.83	1.2	2.76	7.83	16.36	3.6	0.46	
29	3	2	F5	MODFRQ	1.45	5.1	9.65	13.45	19.35	29.2	39.6	10.85	0.53	0.38	0.26	0.5	
30	3	2	F6	MEAN	17.6	29.1	11	8.2	16.5	15.2	6.3	4.4	2.65	3.55	1.76	0.67	
31	3	2	F6	MEANF	4.4	15.7	6.9	4.75	12.55	21.3	3.9	2.55	2.28	3.31	1.25	0.55	
32	3	2	F6	STDDEV	12.02	16.83	3.54	7.78	9.05	11.03	4.67	1.27	4.76	2.16	1.86	0.39	
33	3	2	F6	MODFRQ	1.45	5.35	9.4	13.6	19.3	29.6	40.1	10.85	0.57	0.39	0.28	0.49	
34	3	2	F5-F6	COHE	72.5	85	67.5	31.5	33.5	30.5	25	48	1.26	2.7	2.54	2.01	
35	3	2	F5-F6	PHASE	19	16	20	29	32.5	34	40.5	24.5	0.8	0.55	0.49	0.62	
36	3	2	F5/F6	ASYM	0.82	0.65	0.96	0.75	0.97	1.23	1.29	1.08	0.67	0.87	0.67	1	
37	4	59	F5	MEAN	19.52	27.78	13.94	6.12	6.75	4.82	1.24	7.19	1.99	4.54	4.11	2.06	

The rows provided in the Quick-File ar as follows:
MEAN: mean amplitude from digital filter data
MEANF: mean fraction of EEG energy in band, from FFT
STDEV: standard deviation of digital filter data
MODFRQ: modal frequency (dominant frequency) from FFT

When 2 channels are gathered, the following is also provided:
COHE: coherence value (in percent)
PHASE: phase value (in percent phase: 0 = inphase, 100 = 180 degrees out of phase)
ASYM: asymmetry (from MEANF data)

1.10 Sample Summary File

The summary file contains "tagged" fields that can be read by a human, or by a program. To write a program to read in the data, you should set up your software to read in the file a line at a time, and by inspecting the label at the beginning of the field, to determine what it contains. Then, your program can read in and process the data. Note that this file specification is subject to change, and that additional fields may appear. NOTE: second-by-second summary data are also available in this file. Contact BrainMaster Technologies for details.

```
SUMMARY FOR: bmirror1  FILE: sum00001

BEGIN_ACQUISITION 1  DATE Sun Apr 14 12:40:18 2002

BEGIN_PARMS
DATE: Sun Apr 14 12:40:18 2002

SESS: 1
NCHANS: 1
NVALS: 8
VALNAMES: DELTA THETA ALPHA LOBETA BETA HIBETA GAMMA USER
INTERVAL: 1.0
NINTERVALS_RUN: 60
FLAG00: 1 0 2 0 0 0 0 0
FLAG01: 0 1 1 1 1 0 0 0
FLAG02: 1 1 0 0 1 0 0 0
FLAG03: 0 1 0 0 1 0 0 0
FLAG04: 0 0 0 0 0 0 0 0
FLAG05: 6 0 0 0
FLAG06: 0 0 0 1 0 0 0 0
FLAG07: 0 0 0 1 0 2 0
MIDI_VOICE: 68 0 0
MODE01: 0 0 0 0 0 0 0 0
MODE02: 0 0 0 0 0 0 0 0
THRS01: 0 0 0 0 0 0 0 0
THRS02: 0 0 0 0 0 0 0 0
THRSA: 240 50
AUTOTH00: 60 20 10
AUTOTH01: 0 0 0 0 0 10 0 0
AUTOTH02: 0 0 0 0 0 10 0 0
DUR: 0
FRLO01:   1.00   4.00   9.50  12.00  15.00  20.00  38.00   7.00
FRHI01:   3.00   7.00  12.00  15.00  20.00  38.00  40.00   9.00
ELEC: A1 Cz A2 -- --
RWDSMPS: 60
END_PARMS

REINITIALIZING:
BEGIN_TRAINING 1  DATE Sun Apr 14 12:40:29 2002

BEGIN_SUMM 1:  NPTS: 60  DATE Sun Apr 14 12:41:28 2002
MIN01:     16      0       0       0        0       0       0       0
MAX01:     68     82      30      40       31      80      80      43
MEAN01: 31.02 18.42  5.68  7.64 10.66 14.92 10.47  7.95
MEANF01: 80.44 19.08  9.14  8.05 13.81 40.12  5.56  8.95
STD01:  9.67 16.65  6.93  8.49  8.68 14.74 16.90  8.05
SIM01:  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
TIM01:   7680    7680    7680    7680    7680    7680   7680    7680
TOT01:   100    100    100     100     100    100    100    100
PTR: 59
HITS: 0
ARTF: 0
END_SUMM 1
```

Etc. etc. etc.

Two Channel Summary:

```
SUMMARY FOR: bmirror2  FILE: sum00001

BEGIN_ACQUISITION 1  DATE Sun Apr 14 19:12:27 2002

BEGIN_PARMS
DATE: Sun Apr 14 19:12:27 2002

SESS: 1
NCHANS: 2
NVALS: 8
VALNAMES: DELTA THETA ALPHA LOBETA BETA HIBETA GAMMA USER
INTERVAL: 1.0
NINTERVALS_RUN: 60
FLAG00: 1 0 2 0 0 0 0 0
FLAG01: 0 1 1 1 1 0 0 0
FLAG02: 1 1 0 0 1 0 0 0
FLAG03: 0 0 0 0 1 0 0 0
FLAG04: 0 0 0 0 0 0 0 0
FLAG05: 6 0 0 0
FLAG06: 0 0 0 1 0 0 0 0
FLAG07: 0 0 0 1 0 2 0
MIDI_VOICE: 68 0 0
MODE01: 0 0 0 0 0 0 0 0
MODE02: 0 0 0 0 0 0 0 0
THRS01: 0 0 0 0 0 0 0 0
THRS02: 0 0 0 0 0 0 0 0
THRSA: 240 50
AUTOTH00: 60 20 10
AUTOTH01: 0 0 0 0 0 10 0 0
AUTOTH02: 0 0 0 0 0 10 0 0
DUR: 0
FRLO01:   1.00   4.00   9.50  12.00  15.00  20.00  38.00   7.00
FRHI01:   3.00   7.00  12.00  15.00  20.00  38.00  40.00   9.00
ELEC: A1 C3 Cz C4 A2
RWDSMPS: 60
END_PARMS

REINITIALIZING:
BEGIN_TRAINING 1  DATE Sun Apr 14 19:12:40 2002

BEGIN_SUMM 1:  NPTS: 60  DATE Sun Apr 14 19:13:38 2002
MIN01:     20      0      0      0      0      0      0      0
MAX01:    413    340    430    166    246    240     66    116
MEAN01: 48.56 20.59 21.97 10.59 11.08 13.69 12.46 10.75
MEANF01: 89.98 19.20 20.54 13.88 16.83 40.41  4.58 11.75
STD01:   nan    nan    nan 30.13 12.46 19.84 17.63 23.88
SIM01: 76.22  3.39  2.63  2.37  1.69  3.73  0.80  3.80
TIM01:    7560    7560    7560    7560    7560    7560    7560    7560
TOT01:   100    100    100    100    100    100    100    100
PTR: 59
MIN02:     10      0      0      0      0      0      0      0
MAX02:    250    225    125    175    125    170    110     60
MEAN02: 30.53 12.10  9.27  8.75  5.17  8.92 12.32  4.73
MEANF02: 89.34 14.51 12.46  8.17 11.85 30.36  4.49  8.78
STD02:   nan 19.25 25.89 31.51 17.79 25.16 21.52 11.24
SIM02: 76.22  3.39  2.63  2.37  1.69  3.73  0.80  3.80
TIM02:    7560    7560    7560    7560    7560    7560    7560    7560
TOT02:   100    100    100    100    100    100    100    100
PTR: 59
HITS: 0
ARTF: 0
END_SUMM 1
```