To the Graduate School:

I am submitting herewith a dissertation written by Christopher Allen Mann entitled "Topographic Brain Mapping as a Diagnostic of Attention-deficit Hyperactivity Disorder." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Psychology.

Joel F. Lubar

Joel F. Lubar, Major Professor

We have read this dissertation and recommend its acceptance:

Richard Saudargas

J C Malone

Accepted for the Council:

Vice Provost and
Dean of the Graduate School

TOPOGRAPHIC BRAIN MAPPING AS A DIAGNOSTIC FOR ATTENTION-DEFICIT HYPERACTIVITY DISORDER

A Dissertation

Presented for the

Doctor of Philosophy

Degree

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Christopher Allen Mann

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Dedication

This manuscript is dedicated to my mother, Shirley Campbell Mann. Her devoted love, support and confidence has enabled me to reach farther than anyone ever thought possible. Thank you Lord for my mother.

Truly I am blessed.

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ABSTRACT

Sixteen channel topographic brain mapping of EEG in 25 nine to twelve year old right handed males with Attention-deficit Hyperactivity Disorder (ADHD) revealed increased theta (4 to 7.75 Hz) and decreased beta 1 (12.75 to 21 Hz) compared with 27 matched controls. The differences were greater when subjects engaged in reading and drawing, and were decreased at rest during visual fixation. Although the differences in subjects with ADHD were generalized, increased theta was more prominent in frontal regions, while beta 1 was significantly decreased in temporal regions. When discriminant function analysis was applied, two principal components emerged which accounted for 82% of the total variance. The predictability of group membership for ADHD was 80%, and for the controls, 74%. These findings support the use of topographic EEG for further elucidation of the neurophysiology of ADHD.

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CHAPTER I

HISTORY OF MINIMAL BRAIN DYSFUNCTION IN CHILD PSYCHIATRY

The field of child psychiatry has always lacked a well agreed upon diagnostic structure within which classification, treatment, and research could be integrated. In fact, as recently as 1968 the only childhood categories provided in the American Psychiatric Association's Diagnostic and Statistical Manual were Adjustment Reaction and Childhood Schizophrenia (DSM, 1952). What is the reason for this?

Historically we know that child psychiatric disorders have existed for many centuries. Often the symptoms were considered evidence of poor moral character, stupidity, or possibly possession by external spirits. In more recent times the social and economic conditions tended to conceal the presence of psychiatric disorders. This, along with a stereotyped work ethic which classified children as miniature adults, tended to dampen childhood individuality. During the colonial period (18 and 19th centuries), it was felt that if the immigrant's child had any difficulties in school it could be attributed to language and culture differences.

As previously noted, individual accounts of child psychiatric symptoms go back many years. A manuscript entitled <u>Hyperactivity: Research - Theory - Action</u>, written by Dorthea and Sheila Ross was dedicated to "a real stalwart whose warmth, wisdom, and steadfast refusal to accept the school's negative appraisals as final gave a very hyperactive child the support he needed in his troubled years" (Ross & Ross, 1976) The stalwart was an English nanny; the very hyperactive child was Winston Churchill. There have been numerous other accounts of overactive behavior patterns in children, a sample of which include Napolean Bonaparte and Thomas Edison.

One of the first documented accounts of hyperactivity found in the medical literature appeared in the journal Lancet in 1902. An English pediatrician, Dr. G.F. Still, published a series of lectures where he noted "abnormal defects in moral control... and wanton mischievousness and destructiveness" in children (Still, 1902). However, it wasn't until the 1920's that its epidemiology and clinical relevance was first brought into focus.

According to reviews of hyperkinesis and minimal brain dysfunction, (Kalverboer, 1978; Kessler, 1980; Rutter, 1982, 1984; Strother, 1973; and Werry, 1979), its origins are found in reports demonstrating that hyperactivity, emotional instability, and anti-social behavior commonly develop following cases of encephalitis (Bond & Partridge, 1926; Hohman, 1922; Kennedy, 1924; Stryker, 1925).

The World War I epidemic of encephalitis lethargica affected a large number of children and as a result many behavioral reports emerged. Stryker labeled 27 behavioral encephalitic sequelae, some of which included irritability, obstinacy, lying, thieving, impaired memory and attention, tics, depression, and general hyperactivity. (Stryker, 1925). From this point forward researchers have attempted to attribute biological causation to a full range of disorders, all of which are manifested behaviorally and academically.

According to Rutter's (1984) review, the next influence came from researchers and clinicians noticing some of the same symptoms following head injury (Blau, 1936; Strecker & Ebaugh, 1924). As Bond and Partridge argued, "The intensively hyperkinetic form of reaction... seems the most conclusively organic." Soon afterward, Kahn and Cohen (1934) proposed a model based on "organic driveness" which argued a relationship existed between school behavior problems and underlying brainstem lesions. However, this classic paper was followed by a discussion which questioned the evidence for implicating the brainstem, and suggested possibilities of cortical damage driving behavioral release phenomena, and the role of personality in adapting to the so called "driveness" (Rie & Rie, 1980).

A discovery which helped support an organic model for hyperkinesis was made by Dr. Charles Bradley in 1937. He found that after administering benzedrine (a newly discovered drug that was a registered trademark of amphetamine sulfate) to children with neurological and behavioral disorders their interest in school work greatly increased. He quotes:

> "Possibly the most striking change in behavior during the first week of benzedrine therapy occurred in the school activities of many of these patients. ... there appeared a definite drive to accomplish as much as possible during the school period... it appeared promptly the first day benzedrine was given and disappeared on the first day it was discontinued" (Bradley, 1937).

Even though this and other similar studies were methodologically flawed with observer bias and inadequate controls, they none the less helped to pave the way to new therapeutic approaches still in use today. Also these studies greatly influence the theoretical emergence of organicity models, which were proposed to have major etiological influence in child psychiatric disorders.

The next set of studies which were eventually to lead to the concept of minimal brain dysfunction were Strauss's experiments on brain injured children. They argued that specific behavioral characteristics such as hyperactivity, disinhibition, and distractibility separated brain injured mentally retarded children from non-brain injured mentally retarded. They concluded that all brain lesions were followed by these kinds of behavioral sequelae, therefore biological causation was achieved (Strauss & Lehtinen, 1947). They argued further that despite evidence of classic neurological signs of perinatal complications in these children, the behavior patterns suggested a minor deviation in the brain. Hence the term minimal brain damage was invoked. Even though we know this is not always the case today, the "Strauss Syndrome" became an accepted diagnosis and one based upon organic brain dysfunction. Moreover, the diagnosis of hyperkinesis became secondary to underlying hard neurologic signs such as certain perceptual disturbances (Bender, 1975). Therefore the treatment of choice came to be known as perceptual-motor training even though little empirical support existed to warrant such practices (Hallahan & Cruickshank, 1973).

The next set of findings which influenced the historical emergence of minimal brain dysfunction were provided by Pasamanick and Knoblock. They investigated the proposed relationship between pregnancy complications and a variety of disorders including mental retardation, cerebral palsy, hyperactivity, and reading disorders (Pasamanick and Knoblock, 1960, 1966; Rogers, Lilienfeld, & Pasamanick, 1955). They argued for a "continuum of reproductive causality", where by perinatal brain damage and the birth process were to vary according to the amount of damage. In other words, when the damage was severe, hard neurological signs and disorders resulted. However, when the damage was mild there would be a "predisposition" to behavioral and learning disabilities, which together would not be accompanied by obvious neurological signs. "Thus, they hypothesized the existence of minimal brain injury that was similar in kind, but not in degree, to the injury that gave rise to cerebral palsy and mental retardation" (Rutter, 1982). Furthermore, it would not be obvious upon neurological examination that any disorder existed.

Therefore, on the one hand we have researchers arguing that psychological sequelae result directly from CNS damage, but on the other hand this so called damage will not always be detectable. Here sparks the beginnings of what will become a major controversy in child psychiatry. Can there exist brain damage without abnormalities on neurological examination, and if so does this damage give rise to psychological sequelae?

In 1966 a U.S. Public Health Service task force met for the purpose of clarifying the mounting confusion and controversy surrounding the minimal brain dysfunction diagnosis. In a monograph published from the meeting, MBD was defined as follows:

> Children of near average, average, or above average general intelligence with certain learning or behavioral disabilities ranging from mild to severe, which are associated with deviations of function of the central nervous system. These disabilities may manifest themselves by various combinations of impairment in perception, conceptualization, language, memory, and control of attention, impulse, or motor function (Clements, 1966).

The declaration goes on to list a number of behavioral, academic, and neurological characteristics which may or may not accompany this complex syndrome. However, as Carey pointed out, they made no mention of the minimum criteria necessary to be diagnosed with MBD. It appears all that we had was a greater constellation of "possible" symptoms with no clearly defined minimum criteria to allow the diagnosis to be applied with certainty (Carey, 1980).

As the need for a more accurate classification system grew, the American Psychiatric Association updated what came to be known as DSM II (1968). A number of new categories were added including behavioral reactions, hyperkinesis, unsocialized aggressive, etc. However, as with the original DSM, DSM II classifications were based upon mixtures of theoretical inferences and generalized descriptions of behavior. There was no mention of minimum criteria for inclusion, nor did there exist any procedures for operationalizing the syndromes. DSM II defined MBD as follows:

> This disorder is characterized by overactivity, restlessness, distractibility, and short attention span, especially in young children; the behavior usually diminishes in adolescence (DSM II, 1968).

The controversies continued. The MBD diagnosis was beginning to be applied to a broader group of behavioral, cognitive, and psychiatric symptoms including their proposed relationship with neurological "soft-signs" (Rasmussen, Gillberg, Waldenstrom & Svenson, 1983; Touwen and Sporrel, 1979). In fact, by 1971 Paul Wender estimated that approximately half of the child psychiatric population received the diagnosis of MBD (Wender, 1971). Could it be that the MBD diagnosis had become a psychiatric "catch all" category where in a variety of heterogeneously different children existed? Gross and Wilson commented, "It is surely remarkable that three-quarters of over a thousand consecutive child patients were found to have this disorder"

(Gross and Wilson, 1974). This in conjunction with later evidence revealing a 20-fold variation in diagnostic rates of hyperactivity between the U.S. and DSM III versus the U.K. and ICD-9, suggested that standardization and operationalization were in grave need (Taylor and Sandberg, 1984; Prendergast, Taylor, Rapoport, Bartko, Donnelly, Zametkin, Ahearn, Dunn, & Wieselberg, 1988).

In 1980 we saw the emergence of DSM III. The new diagnostic nomenclature attempted to separate what had become a grab-bag category called MBD into a proposed set of component disorders. The disorder was now labeled attention deficit disorder with and without hyperactivity along with ADD residual type (DSM III, 1980). The residual diagnosis indicated that the child once displayed hyperactive symptoms but no longer does. Two other disorders, labeled separately, were conduct disorder and oppositional disorder. These two are crudely separated by the severity with which the child violates rules and norms; the later being more severe. As will become evident, the DSM III taxonomy will began to reflect a shift in theoretical focus from organic and neurological based models toward specific behavioral and academic criteria.

Researchers and clinicians were beginning to recognize at least some behavioral stability within the disorder. This in turn allowed for different methods of diagnosis and treatment, while at the same time it opened the door to yet new controversies. Do there exist distinct clusters of symptoms separate from conduct disorders, oppositional disorders etc.? If so, do attention deficits lie at the central core of the disorder? Does ADD have a common etiology, follow-up course, treatment response, and/or biological correlates which in turn validate the disorder?

As Rutter (1984) argued, "the issue is not whether hyperactivity/attentional deficit syndromes differ from normality (which obviously they do), but rather whether they differ in any meaningful way from other psychiatric conditions". He went on to argue that in order for any diagnostic category to possess real clinical utility, it must be proven to be distinctive by its etiology, course of action, response to treatment, or at least some characteristic other than the symptoms proposed to define it. (Rutter, 1984). In other words, it is of little value to classify a child as hyperkinetic because of the presence of hyperactivity, or a child as ADD because he has so called attention deficits. To Rutter this is no more than a tautology.

What must be done is to distinguish ADD, MBD, etc. from conduct disorder, schizophrenia, depression, and the like. Only then can we expect to gain clinical utility. Otherwise all we have is another fancy name based upon what might be a very different etiology. Within the medical and psychological literature, when a disorder changes names every time the classification system is updated it seems safe to say that we do not fully understand its causes or course of action. As Rie, (1980) stated in his review, the definition of minimal brain dysfunction has been regarded as a "sophisticated statement of ignorance" (Grinspoon and Singer, 1973), a "simulacrum of symptomatology" (Twitchell, 1971), a "misnomer due to naivete about brain-behavior relations" (Benton, 1973), and "the unwitting confusion of a psychologic construct with a biomedical fact" (Birch, 1964). In fact, a number of investigators have argued that the MBD concept should be discarded altogether (Schmitt, 1975; Twitchell, 1971).

In light of the fact that the MBD diagnosis has possessed definitional ambiguities, it seems appropriate to investigate some of the proposed definitions. The diagnostic classifications have encompassed medical, psychological, and educational models, with supporters of each arguing that they possess empirical support to back their claims.

CHAPTER II

DEFINITIONAL AMBIGUITIES IN DSM CLASSIFICATIONS

While admitting that definitional controversies continue we are not yet sure whether we continue to suffer from absence of empirical facts, or whether we are failing to incorporate research data into current conceptualization. The debate has continued not only in reference to the specific elements within the MBD classification, but also about which practices and professions should treat these children (Rie and Rie, 1980). Where one investigator questions the inclusion of the term minimal, another asks whether the term applies to neurology or to the behavioral and educational effects.

Rutter makes an interesting point by arguing that "uniformity in symptomatology does not constitute a necessary criterion for the validity of a syndrome, or even of a specific disease entity" (Rutter, 1983). He points out a number of medical examples where patients may present with highly diverse clinical histories that are still known to represent a specific pathological cause. For example, skin rashes, tabes, and general paralysis appear to have little in common. Once more, they will not necessarily occur together or at the same time in a given individual. Yet, because we know that all of these symptoms are caused by the same spirochete bacteria, we have no difficulty grouping them under the disease commonly called syphilis. Another more current example may be the human T-lymphotrophic retrovirus type III or HIV. While this is a single virus it has variations in expression. Also, the virus is neurotrophic, therefore affected patients can present with myelopathy, peripheral neuropathy, or any number of dementias.

Could not these same conditions be applied to the MBD or ADHD diagnoses? They could if and only if the symptoms, no matter how diverse, were part of the same etiology. As stated earlier, to this point these classifications still lack the necessary foundations to warrant well agreed upon, homogeneous diagnoses. What then can be said about the validity of our definitional system? Perhaps the best method to find out is to explore the components of each disorder paying particular attention to heterogeneous characteristics, and also to the argument that we are sub-typing symptoms of a unified disorder.

Minimal Brain Dysfunction

Historically, because of the heterogeniety of symptom classifications various health and education professions have approached what may be the same disorder from a number of professional viewpoints.

Minimal brain dysfunction (MBD) has classically been a neurological diagnosis (Rosenthal and Allen, 1978).

Although there are a variety of definitions, according to Rie and Rie (1980) most encompass the following:

1. The link between certain abnormal motor, sensory, and intellective functions and "dysfunction" in the brain.

2. The minimal nature of the noted behavioral and/or educational problems and/or of the brain dysfunction, apparently in the sense that demonstrable CNS impairment does not exist and/or that the effects of the brain dysfunction are subtle, or perhaps more subtle than the effects of demonstrable CNS impairment.

3. The belief that the noted behavioral and/or intellectual problems are of "specific kinds," which are presumably different from behavioral and/or intellectual problems that are the consequence of non-CNS dysfunctions.

4. The occurrence of intellectual problems "without evident lowering of general intellectual capacity," although the somewhat contradictory modification of this assertion also appears: that overall intellectual functioning is not reduced to subnormal ranges.

5. The wide variety of causes of the CNS dysfunction, ranging from genetic to environmental (Rie and Rie, 1980).

Not unlike most elements in the definition of MBD, the term "minimal" has sparked controversy. As discussed earlier, one of the major reasons is that it can refer to proposed minimal neurological impairment and to minimal behavioral and/or intellectual/cognitive impairments. Remember the roots of the MBD classification lie in the models emphasizing organic etiology. However, those same models have yet to provide reliable organic determinants.

The term "minimal" was also adopted to help distinguish specific problems from those of demonstrable and more profoundly affected children, including the mentally retarded and those with obvious brain damage. Again, notice the definitional influence of a theory emphasizing a pathological continuum.

Some researchers, including Birch, argued that "by attaching the adjective 'minimal' to the term does not increase the descriptive accuracy of the term or add to either its scientific validity or its usefulness" (Birch, 1964). Based on his work with primates and cats, Benton (1960) has criticized the term "minimal", especially if it is postulated that the dysfunction(s) originated perinatally or in early development. Because there is a lower probability of sequelae of early neurological insults in animals, and there have been absences of gross behavioral and intellectual problems following hemispherectomy in animals and most recently in children following epilepsy surgery, one may argue that any proposed neurological condition that results in MBD-like behavior cannot reasonably be regarded as minimal.

According to Rie and Rie it may well be that the real dysfunctions are too subtle to be detected on neurological examination instead of simply minimal in nature, especially if they are later proven to result from neurophysiological rather than anatomical or morphological problems. They further argue that the term "minimal" seems better suited to serve a connotative rather than denotative function (Rie and Rie, 1980).

In 1962 the Oxford International Study Group on Child Neurology held a conference whose focus was concerned with problems of definition and diagnosis (Bax and Keith, 1963). According to Strothers' review, there were two primary conclusions which resulted (Strothers, 1973). The first was that the minimal brain damage diagnosis was to be replaced by the new classification of minimal brain dysfunction, also later called minimal cerebral dysfunction. Due to the lack of methodologically sound evidence associating MBD with specific neurological signs, either hard or soft, it was felt a dysfunction label was better served. Another reason for the change was due to a growing consensus that we cannot infer brain damage from behavioral signs alone.

The next major decision was to begin a more valid process of individual classifications. More attempts must be made to isolate homogeneous categories from what was believed to be a heterogeneous "grab bag" of diagnoses. A number of diagnostic labels had been proposed, including "hyperkinetic syndrome", (Laufer and Denhoff, 1957; Stewart, Ferris, Pitts, & Craig, 1966), "developmental clumsiness", (Gubbay, Ellis, Walton, & Court, 1965; Reuben and Bakwin, 1968), "choreiform syndrome", (Prechtl, 1962), "congenital auditory imperception", (Allen, 1952), "dyslexia", (Critchley, 1964) etc. However, as Strothers pointed out, there was little agreement or empirical support for any one classification (Strothers, 1973).

Many of the most troublesome characteristics of the MBD classification lie in its definitional ambiguities. Its specificity of dysfunction has ranged from problems in "any of the areas of brain dysfunction", to "abnormal manifestations of motor, sensory, or intellectual function", to "specific kinds of learning, thinking, and behavioral sequelae" (Clements, 1966). However, as previously noted, we are still not clear in which ways these children are different. Moreover, the problem is surely not all neurological. When we take into account the complexities of cognitive functions in the developing child, it becomes very difficult to distinguish between effects that are due to neurological impairment and effects due to environmental and social conditions.

Nevertheless this idea of unique, identifiable patterns of functioning resulting as a consequence of neurological dysfunction remains attractive. From Wender's assertion that "the behavioral pattern associated with minimal brain dysfunction is rather distinct and easily identifiable", to Bakwin and Bakwin's claim that "the behavioral manifestations of cerebral dysfunction, whatever the etiology, are fairly uniform and characteristic", and to the multitude of research demonstrating the clinical utility of stimulant medications, the organic models remain among the front runners (Wender, 1971; Bakwin and Bakwin, 1966).

While we must admit that definitional ambiguities exist, we also know that neurologic impairments can and do affect human adaptation adversely in a variety of ways and in different degrees. However, in order for the MBD diagnosis to maintain clinical and research relevance, the consequences of the proposed dysfunctions must be distinguishable from the consequences of other determinants of adaptation. This goes back to Rutter's argument that in order for a diagnostic category to have real clinical utility, it must be proven to be distinguishable by its etiology, course of action, response to treatment, or at least some characteristic other than the symptoms proposed to define it (Rutter, 1984).

We will never be able to justify an overuse of terms that are descriptive of grossly different kinds of behavioral, psychiatric, and educational problems until we better understand the impact of all these determinants on the developing organism. However, at least in terms of research, this is still very difficult because of the methodological problems inherent in all social science research. On the one hand we should severely restrict our subject selection criteria and then test only a small number of dependent variables. This increases the validity, because we are now more sure we are measuring what we believe we are measuring. On the other hand, how will we be able to measure and hence understand the impact of other influences on the organism in question? The best answer is to restrict the methodology and at the same time restrict our generalizations. Ultimately we can hope to have a more valid and reliable set of conclusions which adds to our cumulating knowledge base.

With these issues in mind what can be said about our current diagnostic processes? What actually happens in the physicians' office and what measures do they use to make their determinations?

One of the major clinical components used to make current diagnoses is the child's medical and behavioral history. The physician will ask if there has been any familial incidence of MBD? Has there been any prenatal or paranatal birth complications, head injuries, etc? As for the behavioral history, the physician must rely more upon recommendations made by adults who maintain daily exposure with the child. Of obvious importance is the reliability of adult reports. For this reason the physician relies on a number of sources including parents, friends, teachers, counselors, and if possible psychologists, social workers, and other health care professionals.

The next step is the neurological examination. Its purpose is to determine:

1. the presence or absence of nervous system malfunction.
2. the location, type, and extent of nervous system lesions.
3. the degree to which the healthy portion of the patient's nervous system can be used for rehabilitation (Dejong, Sahs, Aldrich, & Milligan, 1968).

First, the neurologist will test a variety of sensory and motor systems. Some of these include the 12 cranial nerves, tests for cerebellar and motor function, as well as tests for reflex status. The exam proceeds in steps by first testing the nervous system in a general sense, and then testing from higher to lower levels of integration. The equipment necessary is not highly specialized and the exam can be conducted in the physician's office or at the patient's bedside.

An important finding in this examination, and one that has contributed a great deal to the controversy is the inclusion of so called "soft-signs" in the MBD diagnosis. Unlike the hard signs of classical neurology, the soft-signs are "slight, inconsistently present, and are not clearly associated with localized neuroanatomical lesions" (Wender, 1971). Some of the soft-signs include poor fine motor coordination, impaired visual-motor coordination, poor balance, clumsiness, strabismus, choreiform movements, and poor speech (Stewart, 1966). The controversy arises in the diagnostic usefulness of these signs. Unlike the hard signs, which include paresis, paralysis, anesthesia, and reflex changes, the prevalence of soft-signs occurs in moderate numbers of children with no signs of academic or medical problems (Kennard, 1966; Touwen, 1979). More will be said on soft-signs below. If the physician felt it was necessary he may also order any number of neurophysiological tests including EEG, evoked potentials, etc. He may also order a neurological scan and/or a blood work-up.

While remaining in a historical context, if the physician felt that the results of these tests and recommendations demonstrated that minor neurological dysfunction had resulted, he would diagnose the child with MBD and begin any number of therapies.

Hyperkinesis

Hyperkinetic syndrome is a classification used interchangeably with Minimal Brain Dysfunction and hyperactivity. Historically, however, while MBD is thought to be of neurological origin, hyperkinesis has been of psychiatric origin (Rosenthal and Allen, 1978). According to DSM, 1968, hyperkinesis falls within a broader category of behavioral disorders that "are more stable, internalized, and resistant to treatment than transient situational disturbances but less so than Psychosis, Neurosis, and Personality disorders. This intermediate stability is attributed to the greater fluidity of all behavior at this age" (DSM, 1968). As with the organic models of MBD, we once again see a continuum approach. It was felt that many, if not all of these disorders had similar etiologies with varying levels of severity, therefore they should be classified under the same broad categories.

According to Rosenthal and Allen's review, hyperkinetic syndrome can be defined as a psychiatric disorder of the total personality. It may consist of hyperactivity, impulsivity, short attention span, high distractibility and excitability, low frustration tolerance, poor school performance, poor peer relationships, and an inability to regulate one's behavior with social norms (Rosenthal and Allen, 1978). Unlike the neurological signs emphasized in MBD, hyperkinesis stresses more globally disruptive and emotional behaviors directed to the child's family, teachers, and peers. Also the hyperactive classification is used to represent the chief symptom instead of a syndrome in itself. According to DSM a hyperkinetic child will be chronically hyperactive and the symptoms will date back to the first few years of life (DSM, 1968).

One researcher has argued that hyperactivity should be divided into three types, with only one to be labeled as hyperkinetic syndrome (Fish, 1971). The three subcategories include overanxious reaction, unsocialized aggressive reaction, and hyperkinetic reaction. He defined the first as "expressed preoccupation with anxiety, nervousness, worries, unrealistic fears, etc.", the second as "denial of anxiety and personal responsibility for feelings and acts", and the third as "poorly integrated and labile behavior which gives the impression of immaturity. This occurs in conjunction with hyperactivity and shortened attention span (Fish, 1971). Even though Fish's strict classification is not well accepted today, it is nevertheless an attempt to provide more clarity in syndrome definition. On the other hand, perhaps the heterogeneous overlap can provide useful. As Rosenthal and Allen argue, it gives us a heuristic advantage to group them collectively because, "if these groups differ from controls in the same ways and if stimulants affect them in the same ways, then perhaps they might be considered as manifestations of a unitary dysfunction" (Rosenthal and Allen, 1978).

Hyperactivity

According to the literature, almost every symptom in child psychiatry has at one time or another been included under the rubric of hyperactivity (Aman, 1984). After Clements and others nominated overactivity as the core symptom of MBD the hyperactive classification grew into an "ideological epidemic" (Clements, 1966; Quay and Werry, 1986). Hyperactivity has become a household term, and in some researchers' opinion grossly abused and overused. For example, English psychiatry, which has been heavily influenced by Rutter and his colleagues, argued that hyperactivity is in fact a rare disorder that may be related to brain damage, but is an unusual, not an inevitable, consequence of it (Rutter and Shaffer, 1980; Schacher, Rutter, and Smith, 1981). There have also been a number of American psychologists, such as Quay, who insist that most cases of hyperactivity are indistinguishable from Conduct Disorder (Quay, 1979).

When we look at the epidemiology of hyperactivity we find its frequency in population studies ranges from a low of 1.6 percent in Britian's 10 year-olds of the Isle of Wright Study to a high of 20 percent in selected American studies (Barkley, 1981; LaGreca and Quay, 1984; Rutter, Graham, & Yule, 1970). This is no surprise when we consider the variability of diagnostic criteria between DSM III and ICD-9. Also according to Glow's cross-cultural research, the British believe that Conduct Disorder takes precedence there by excluding diagnoses of hyperactivity or attention deficit disorder (Glow, 1980).

In 1970 Werry and Sprague proposed the following definition:

> Hyperactivity has been defined as a chronic, sustained level of motor activity which, because of its excessive degree, is the source of continued

complaint from the child's home and his other environments (Werry and Sprague, 1970).

In a critical analysis Rie and Rie (1980) point out that the terms chronic, sustained, and excessive attempt to demonstrate that the behaviors can be easily discriminated from normal motor behaviors. However, anyone who works with these children knows this is not always the case. Perhaps one could argue that the hyperactive classification is as vaguely defined as the MBD classification, if not more so. Not only is it subjectively and situationally interpreted but it can grossly overlap with non-hyperactive "energetic" behaviors seen in all children. One group of researchers went so far as to argue that hyperactivity is that aspect of a child or person's behavior that annoys the observer (Budenhagen and Sickler, 1969). Others point out instances where children with little motor activity may frustrate one person while a more active child is readily accepted by another person.

In a study investigating 100 clinic referred children with primary complaints of hyperactivity, it was found that 35 percent of the subjects were judged to be hyperactive by the professionals observing them. Less than half of the children were judged hyperactive by any of the observers and only 13 percent were rated hyperactive by all observers (Kenny, 1971). This problem exposes another important weakness in diagnostic classifications, that being the subjectivity of behavioral ratings. This will be explored in more detail later.

In realizing the variability inherent in all behavioral observations, many researchers have attempted to apply more objective and quantifiable measures of motor activity. Although their usefulness has proven questionable we must applaud the ingenuity of some of these hyperactive measures.

Some researchers have used ethological approaches by observing the number of objects touched or manipulated, or the number of grid squares transversed in a room in a time period. Others have used pedometers and converted wrist-watches to record movements of the wrists and feet. They have used "actometers" to measure trunk movements. They have even used ultrasonic movement detection beams, all of which to help better quantify hyperactive behavior from non-hyperactive behavior. As Rie and Rie point, these studies do contribute to our knowledge base because they suggest that so called hyperactive children do not differ in amount of motor activity per se but in the quality or type of activity (Rie and Rie, 1980). We can interpret the lack of significant findings to demonstrate that hyperactive children are not necessarily more hyperactive than other children, but their activity is more purposeless, nonfunctional, and often annoying. However, the question still remains: How do we measure this phenomenon? Perhaps these studies succeed in telling us not what hyperactivity is but what it is not. They may also help in better quantifying more specific categories which together may contribute to the hyperactive and/or attention deficit syndrome.

As stated in the introduction, since the emergence of DSM III in 1980 and DSM III-R in 1986, we have begun to shift our focus from the generic classification of hyperactivity to Attention Deficit Disorder with or without hyperactivity. To mention briefly, DSM III offered the first diagnostic classification system of child psychiatric disorders that specified criteria for diagnosis of each disorder. It also offered a multiaxial approach to diagnosis with the clinical psychiatric syndrome coded on Axis I, developmental disorders on Axis II, biological factors on Axis III, psychosocial factors on Axis IV, and adaptive functioning on Axis V. Whether correctly or incorrectly, we have begun to attempt to isolate specific components of the disorder(s).

The DSM III categories for Attention Deficit Disorder with or without hyperactivity (314.01 and 314.00) were restricted to three areas: Attention, Impulsivity, and Hyperactivity. The behaviors in each category were as follows:

A. Inattention. At least three of the following:

1. often fails to finish things he or she starts
2. often doesn't seem to listen
3. easily distracted

4. has difficulty concentrating on schoolwork or other tasks requiring sustained attention
5. has difficulty sticking to a play activity

B. Impulsivity. At least three of the following:
1. often acts before thinking
2. shifts excessively from one activity to another
3. has difficulty organizing work (this not being due to cognitive impairment)
4. needs a lot of supervision
5. frequently calls out in class
6. has difficulty awaiting turn in games or group situations

C. Hyperactivity. At least two of the following:
1. runs about or climbs on things excessively
2. has difficulty sitting still or fidgets excessively
3. has difficulty staying seated
4. moves about excessively during sleep
5. is always "on the go" or acts as if "driven by a motor"

D. Onset before the age of seven

E. Duration of at least six months

F. Not due to Schizophrenia, Affective Disorder, or Severe or Profound Mental Retardation. (DSM III, 1980)

In order to receive the diagnosis of ADD with hyperactivity three out of five behaviors must be present in the inattention category, three out of six in the impulsivity category, and two out of five in the hyperactivity category. The other characteristics labeled D, E, and F must also apply. The criteria for the diagnosis of ADD without hyperactivity is the same except that criterion C does not apply. Finally, in order to receive a diagnosis of ADD residual type the individual must have been previously diagnosed with ADD with hyperactivity, but currently show no signs of hyperactivity in adolescence or adult life (DSM III, 1980).

Another important aspect of DSM III was that it was the first classification system to propose that any child fulfilling the hyperactive criteria must also have attention deficits. However, it is also possible that a child can have attention deficits yet not be hyperactive. This advances the first real separation in our classification system.

If we look a little closer we find all that is necessary for a child to receive the diagnosis of ADHD is that he or she fulfill two out of five hyperactive criteria. For example, if Billy has difficulty staying seated (#3), and moves about excessively during sleep (#4), then by DSM III's definition he must also test positive in the other categories. In other words, a child cannot be hyperactive alone. Is this scenario possible?

In its most current version, DSM III-R, the diagnostic criteria once again changes. Apparently enough people believed that classifications were too broad in DSM II, too specific in DSM III, therefore it was to be broadened again in DSM III-R. Currently there is a list of 14 behavioral symptoms that are believed to characterize ADHD. In order to be diagnosed any eight must be present, as well as characteristics D, E, and F from above. Notice also how some the proposed behaviors change, and how severity of symptoms are included. In DSM III-R the diagnostic criteria for 314.01 Attention Deficit Hyperactivity Disorder is as follows:

Note: Consider a criterion met only if the behavior is considerably more frequent than that of most people of the same mental age.

A. A disturbance of at least six months during which at least eight of the following are present.

1. often fidgets with hands or feet or squirms in seat (in adolescents, may be limited to subjective feelings of restlessness)
2. has difficulty remaining in seat
3. is easily distracted by extraneous stimuli
4. has difficulty awaiting turn in games or group situations

5. often blurts out answers to questions before they have been completed
6. has difficulty following through on instructions from others (not due to oppositional behavior or failure of comprehension), e.g., fails to finish chores
7. has difficulty sustaining attention in tasks or play activities
8. often shifts from one uncompleted activity to another
9. has difficulty playing quietly
10. often talks excessively
11. often interrupts or intrudes on others, e.g., butts into other children's games
12. often does not seem to listen to what is being said to him or her
13. often loses things necessary for tasks or activities at school or at home (e.g., toys, pencils, books, assignments)
14. often engages in physically dangerous activities without considering possible consequences (not for the purpose of thrill-seeking), e.g., runs into street without looking

Note: The above items are listed in descending order of discrimination power based on data from a national field trial of the DSM III-R criteria for Disruptive Behavior Disorders.

B. Onset before the age of seven.

C. Does not meet the criteria for a Pervasive Developmental Disorder

Criteria for severity of Attention-deficit Hyperactivity Disorder:

Mild: Few, if any, symptoms in excess of those required to make the diagnosis and only minimal or no impairment in school and social functioning.

Moderate: Symptoms or functional impairment intermediate between "mild" and "severe".

Severe: Many symptoms in excess of those required to make the diagnosis and significant and pervasive impairment in functioning at home and school and with peers (DSM III-R, 1986).

As noted earlier DSM III-R criteria allow for any permutation or combination of 8 of 14 listed symptoms. Unlike DSM III it does not require that symptoms of inattention, impulsivity, and motor activity all be present, and at the same time it does not make a distinction between ADD with and without hyperactivity or ADD residual type. Therefore all children meeting criteria will now fall under the same rubric of Attention-deficit Hyperactivity Disorder whether they present with symptoms of hyperactivity or not. According to Cantwell, DSM III and DSM III-R are similar in that they specify cut off criteria for inclusion but different in which criteria are necessary for diagnosis (Cantwell, 1987).

The extent to which hyperactivity and attention deficits are related remains an important question that requires further study. Some, such as Rutter, have argued there are many children who show attentional deficits but not hyperactivity, as well as the converse (Rutter, 1984). In a study by Ullman, Barkley, and Brown (1978) of hyperactive children who responded positively to stimulant therapy, it was found that based upon measures of activity and attention, the two disabilities (hyperactivity and inattention) overlapped surprisingly little. On the other hand, Levy and Hobbes (1981) found that attentional measures drawn from a continuous performance test provided good differentiation between hyperkinetic and non-hyperkinetic children. It seems safe to assume that there is at least some relationship between hyperactivity and attentional deficits because most, but not all investigators have demonstrated that hyperactive children perform poorly on measures of attention (Rosenthal and Allen, 1978).

To conclude, according to Rutter we need to determine if attentional deficits (either general or of a particular type) are more frequently found in children selected with pure forms of hyperactivity than they are in nonhyperactive children with similar behavioral disturbances. We must further ask whether children with hyperactivity associated with attention deficits differ from those with hyperactivity alone (Rutter, 1984). We have yet to answer these questions because we still do not fully understand the etiology of this disorder.

Attention Deficit Disorder

Attention-deficit/Hyperactivity Disorder is the newest in a long line of DSM classifications. Following observations that many hyperactive children displayed shortened attention spans, a plethora of research was instigated attempting to empirically validate attention deficits as the core symptom (Firestone & Martin, 1979; McGee, Williams & Silva, 1984; Schacher et al., 1981). As a result of any number of etiological determinants (neurological, genetic, constitutional, and/or environmental), the major impetus causing the child's academic and social problems was believed to be a faulty attention span. This would directly lead to other externally manifested symptoms of impulsivity, distractibility, and in some cases hyperactivity.

In looking closer we notice the definitional emphasis now shifts away from the neurological or the educational toward the psychological and cognitive. More studies have begun investigating cognitive and metacognitive measures of memory, problem solving, vigilance, relevant and irrelevant stimulus displays, reinforcement, and reaction times to name a few (Douglas, 1983; Brown, 1975; Parry and Douglas, 1983, Wender, 1971). Other researchers have adopted interactionist positions (Gorenstein & Newman, 1980), while others have argued that ADD results from multiple etiologies (Barkley, 1982; Ross & Ross, 1982).

While multiple theories exist, DSM III-R stipulates the essential features of ADHD as "developmentally inappropriate degrees of inattention, impulsiveness, and hyperactivity" (DSM III-R, 1986). As stated earlier, the child must present with at least eight of a possible fourteen symptoms, all of which are proposed to revolve around these three core features. Lets look at these features in more detail, especially the first two.

Inattention

While there is agreement that these children display various levels of inattentativeness, there is little agreement of how best to characterize and measure it. We know attention is not a unitary construct. In light of this, researchers have attempted to isolate some of its proposed components both in the laboratory and classroom settings. Some of the components include sustained attention and vigilance. In definitional terms we ask, "How long can the child remain attentive, and under what circumstances does attention shift?" Researchers have used observational ratings and psychometric tests including one of the more popular, the Continuous Performance Test (CPT). While significant differences have been shown (Douglas & Peters, 1979), due to the environmental and situational effects, researchers have had difficulty validating these measures.

Other proposed components of inattention are distractibility and selective attention. These terms refer to an individual's ability to focus on critical target stimuli while ignoring irrelevant stimuli. Research using these paradigms has encountered more than the usual amount of confusion because as Douglas argues, there are far too many explanatory principles used to explain why subjects fail to ignore extraneous stimuli. "If the child responds incorrectly, should this be attributed to a failure to ignore the stimuli, a failure to discriminate between correct and incorrect stimuli, or a failure to inhibit an ongoing response tendency to push the lever?" (Douglas, 1972).

Although conceptual and methodological problems exist, the reaction time and vigilance studies have demonstrated that children with ADHD make more errors between trials and more errors of commission to nonsignal stimuli (Dykman, Ackerman, & McCray, 1979). On the measures of selective attention and distractibility, clinical subjects tend to make more intrusive errors, and attend more to irrelevant stimuli (Douglas & Peters, 1979).

Impulsivity

Impulsive behaviors are those which are erratic, poorly defined, and usually instigated before the child makes any cognitive appraisals. An example may be acting before thinking, frequently calling out in class, or having difficulty awaiting turn in games or group situations (DSM III, 1980).

While there is agreement that impulsivity is a core feature of ADHD, the construct itself may be even more poorly defined than inattention (Milich & Kramer, 1985). First of all, there is little evidence to suggest that it is a unitary construct. In fact, there have been surprisingly few studies investigating impulse control at all (Campbell & Werry, 1986). Secondly, impulsivity is not specific to ADHD. It can be found in any number of psychiatric disorders of childhood. Finally, there is only limited empirical support for impulsivity as a stable construct because most of its proposed measures do not covary (Milich & Kramer, 1985).

The most popular measure of impulsivity has been the Matching Familiar Figures Test (MFF). The child is to select from an array the one picture that is identical to the standard. Those children who respond too rapidly without adequately comparing pictures will score lower and be considered impulsive. While several studies have found differences (Campbell, Douglas, & Morgenstein, 1971; Schleifer et.al., 1975) it is not evident that the differences are specific to ADHD, because conduct problems (Firestone & Martin, 1979), and learning disabilities (Campbell, 1974) can show similar patterns.

Research investigating impulsivity may be flawed on a number of grounds. According to Douglas, too much emphasis is placed on response time alone. Other equally important variables are the child's learned rate of responding, and the efficiency with which they process available information. "Consequently, theories that do not look at the interaction between time and quality of processing will be misleading" (Douglas, 1983).

Although we may be fairly sure that these behavioral and cognitive characteristics influence the child with ADHD's ability to interact academically and socially, we have yet to find a specific set of characteristics which reliably defines this disorder. Many agree the ultimate answer will encompass some degree of interaction between the multitude of behavioral, physiological, and cognitive measures and theories. (Barkley, 1982).

Learning Disability

While we have explored viewpoints from fields of neurology and psychiatry, the next approach comes from the field of education. As would be expected, diagnostic emphasis is placed upon a host of psychometric and educational measures. However, what sets the LD label apart from the others is that more emphasis is placed on the discrepancies between what a child should be, but is not achieving. Given this premise, the LD classification is more often used when the child displays specific discrepancies in subject areas. For example, a child's test scores may fall in the normal or even above normal range for all subject areas except reading where it is below average norms or below what is "expected" based upon the other scores. In this case the child may be classified as reading disabled, which itself falls under the general heading of learning disability.

In 1968 Congress appointed a National Advisory Committee on Handicapped Children to develop specific criteria for learning disabilities. They proposed the following definition:

> Children with specific learning disabilities exhibit a disorder in one or more of the basic psychological processes involved in understanding or using spoken or written language. These may be manifested in disorders of listening, thinking, or talking, reading, spelling, or arithmetic. They include conditions which have been referred to as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, developmental

> aphasia, etc. They do not include learning problems which are due to primarily to visual, hearing, or motor handicaps, to mental retardation, emotional disturbances or to environmental disadvantage. (National Advisory Committee on Handicapped Children, 1968 p.34).

In 1975 Congress passed The Education for All Handicapped Children Act which, although controversal, maintained the same definition. In essence children diagnosed with learning disabilities have at least normal intelligence: are not retarded, deaf, blind, or emotionally disturbed; and have academic problems which are not due to cultural or economic disadvantages. Exactly how the disadvantages are measured remains a mystery.

For the most part learning disabilities affect basic communication skills. The skills may be in reading (dyslexia, or disedietic reading disability), writing (dysgraphia), arithmetic (dyscalculia), understanding spoken words (dysphasia), speaking too much or out of context (hyperprosody) etc.

In terms of a definition, the federal guidelines have tended to follow the views of McDonald and others who emphasize educational difficulties and capacity and performance discrepancies instead of perceptual impairments and so called brain dysfunction (McDonald, 1968). The discrepancies are to fall between the child's abilities and his achievements. The areas where the discrepancies fall are in oral and written expression, reading comprehension, basic reading skills, listening comprehension, mathematics calculation, mathematics reasoning, and spelling (Federal Register, 1976). These guidelines become critical because they are heavily influenced the federal government's decisions to fund educational institutions. According to Bryan and Bryan, because of the absence of homogeneously empirical groups, "money rather than logic is likely to affect contemporary practices in who and how many get defined as learning disabled, educable mentally retarded, and emotionally disturbed" (Bryan and Bryan, 1980).

By 1980 Public Law 94-142 stated that not more than 2% of the state's population who are defined as learning disabled will be eligible for federal aid. Given that some researchers have estimated that up to 28% of the elementary school population alone suffer from learning disabilities it is likely that adjustments in our definitions need to be made (Bruinincks, Glaman, and Clark, 1971; Clements, 1966).

As with all other diagnostic labels discussed thus far, the LD diagnosis has its criticisms. The first arises when we attempt to operationalize the concept of "basic psychological processes" noted in the definition. There is little agreement as to what constitutes these processes, or how they are related to each other, to say nothing of how they may relate to academic pursuits. According to Keogh et.al., "we are at a loss to identify a single such skill that may be reliably associated with a child's failure to succeed academically (Keough, Major, Omori, Grandara, & Reid, 1980).

Another problem arises in the exclusion criteria. By excluding children on the basis of etiological and other nonbehavioral criteria, it leaves it to the "expert" to determine when mental retardation, emotional problems, or environmental disadvantages are the primary causes of the learning disability. Who makes this decision and based upon what criteria? Furthermore, the behaviors delineated in the definition and the etiologies specified as exclusionary factors are so inextricably interwoven that to diagnose one as primary and one as secondary is virtually impossible.

On the other hand, a number of researchers believe that diagnostic differentiation is possible. They argued that all children including the educable mentally retarded and emotionally disturbed are just as capable of having learning disabilities (Hallahan and Kauffman, 1976). In fact, there have been many instances of MBD and hyperkinetic children who were co-diagnosed with learning disabilities (Rosenthal and Allen, 1978). The same process happens today except we co-diagnose with a new label called ADHD (Attention-deficit/Hyperactivity Disorder). There have even been instances where children who do not perform at the level of their "presumed" intellectual ability are labeled LD, even in the absence of any specific deficit (Rosenthal and Allen, 1978).

Where does this leave us? At the present time we have a number of theories but no reliable and universally accepted method to differentiate learning disabilities from other diagnostic groups. For all we know LD may best be defined as a subcategory of ADHD which itself may be a subcategory of MBD... As many have argued, this definitional ambiguity has brought forth serious methodological questions to almost all empirical efforts to this point (Rubenstein & Brown, 1984). Perhaps as Bryan and Bryan argue, the LD term is far too broad to be of any diagnostic value. Furthermore, "our diagnostic labels may be serving political and social aims, but empirically such distinctions are not warranted. Indeed our conceptual differentiations have prematurely outstripped our empirical knowledge" (Bryan and Bryan, 1980).

Conduct Disorder

This disorder is characterized by a persistent pattern of conduct in which the basic rights of others and major age-appropriate societal norms or rules are violated (DSM III-R, 1986). While there are three basic types, group type, solitary aggressive type, and undifferentiated type, the underlying emphasis (according to Psychodynamic theory) is for the child to externalize his anxiety and conflicts. Independent of actual circumstances, blame is directed outwardly toward other persons and objects in the form of verbal and/or behavioral disobedience. The symptomatology of these disorders includes lying, stealing, vandalism, aggressive attacks on others, truancy, running away from home, sexual promiscuity etc.

Conduct disorder affects more adolescents including, like other disorders, a preponderance of males. The solitary aggressive type includes under-socialized patterns such as deficient verbal mediation skills, persistent academic failure, poor social skills, and as Quay argues, "a poor prognosis for successful adult living" (Quay, 1986).

It has been demonstrated in the general population (Sandberg, Wieselber, & Shaffer, 1980) and in clinical studies (Sandberg, Rutter, & Taylor, 1978) that most individuals with this type of conduct disorder are also hyperactive and to a lesser extent vis versa. However, because we see isolated conflicting cases, the controversy surrounding syndrome independence continues. One current theory suggests a "pure" hyperactive group, if there be such a thing, will be distinctive in terms of a stronger association with cognitive deficits (Rutter, 1984).

In the group type of Conduct disorder individuals exhibit more socialized behaviors by involving themselves with peers in illegal or at least norm-violating behavior (Loever & Schmaling, 1985). While this pattern tends to occur less frequently, it has also been closely tied with the legal and sociological term juvenile delinquency. Interestingly while hyperactivity as a behavioral trait has appeared on this dimension, it is by no means central. In fact, as Quay argued, the behaviors associated with "hypoactivity" are more frequently seen in the group type of conduct disorder (Quay, 1986). Also, while it is associated with delinquency in adolescence, adjustment in adult life appears to be significantly better than in the solitary aggressive type.

What may set conduct disorder apart from the others is that it has maintained a behavioral emphasis, both in terms of diagnosis and etiology. There is little if any research investigating nonbehavioral constructs. Most studies have used observations, behavioral rating scales, and clinical interviews. There is no well agreed upon medical/ neurological evidence specific to conduct disorder. Because of this the literature tends to place more etiological emphasis on psychoanalytic theory including explanations based on anxiety, conflicts, and levels of ego organization. However, in a number of clinical and factor analytic studies, conduct disorder of the solitary aggressive type has loaded highly with hyperactivity, attention deficits, impulsivity and the like (Achenbach & Edelbrock, 1978; Lahey, Green, & Forehand, 1980).

It has been estimated that conduct disorder constitutes half of the children diagnosed by child psychiatrists (Rutter, Graham, Yule, 1970; Graham, 1979). While there is agreement that it constitutes a heterogeneous group of children and problems, there is far less agreement on issues of subclassification (Rutter and Giller, 1983). Specifically, what is the relationship (behavioral, physiological, genetic, etc.) between conduct disorder and hyperactivity, MBD, or ADHD? According to Hinshaw, the safest conclusion we can make on the proposed relationships between hyperactivity and attention deficits versus conduct disorder and aggression is that "both show partial independence and some degree of divergent validity" (Hinshaw, 1987).

There have been few childhood disorders which have generated so much interest and controversy as minimal brain dysfunction, hyperkinesis, hyperactivity, learning disability, attention deficit disorder and conduct disorder. While there has been a multitude of research attacking every possible angle, especially in the past ten to fifteen years, none have provided a unified and well agreed upon classification system within which diagnosis and treatment could be integrated effectively. When a classification system is modified every time it is updated, it becomes obvious that we as researchers and clinicians lack the necessary understanding to effectively isolate the central characteristics of the disorder(s).

While much of the current review has critically emphasized what may well be DSM's shortcommings, it was not meant to criticize the work done to this point. We have obviously encountered a very complex and ill defined disorder or set of disorders which likely has multiple cumulating influences. However, there are common themes which infiltrate the child's behavioral, academic, and social environments, making it very difficult for all concerned to adapt and function productively. Perhaps our best hope lies in integrating new technology with existing techniques. It will be the multidisciplinary studies which will ultimately identify risk factors, and possible causal mechanisms of attention deficits, and of course their interactions.

CHAPTER III

ASSESSMENT

Behavioral Observation

Parent and teacher rating scales have remained the most widely used assessment measures in diagnosing Attention Deficit Disorder and hyperactivity (Ross & Ross, 1982; Barkley, 1981). This should not be surprising because the home and school settings constitute the majority of the child's environment. It will be here that problem behaviors are manifested and later brought into clinical focus. While other behavioral assessments exist, such as direct observation, self-reports, and various laboratory measures of attention and impulsivity, none receive the acceptance and wide use of parent and teacher ratings.

While ADD and hyperactive rating scales were originally designed to assess behavioral changes resulting from stimulant pharmacotherapy (Connors, 1969), their uses have grown to include a host of other applications. To begin, they are simple and efficient in terms of time, cost, equipment, and personnel, especially compared to psychological testing, behavioral observations, and laboratory measures. Also, because ADHD is defined behaviorally and manifested at home and school, parent and teacher ratings become essential for measuring, "frequency, severity, and appropriateness of children's behaviors." (Edelbrock and Rancurello, 1985). Behavioral ratings can also provide indices of behavioral changes plotted over time, as well as provide social validation of various interventions aimed at modifying problem behaviors.

Other advantages of rating scales are that they are administered in the child's natural environments. Many agree this provides more individually accurate assessments, especially in reference to issues of situational specificity. Rating scales also force the informant to rate specific component behaviors which are themselves empirically derived to represent "core" symptoms of a given disorder. This has many advantages over making subjective global judgments.

Rating scales are also standardized to help reduce subjectivity in adult judgments. Furthermore, they are broken down into age-graded norms. This provides a basis for determining whether reported behaviors are age appropriate or are deviant relative to age matched controls. This characteristic becomes particularly important when teachers rate children thought to have attention deficits and hyperactivity. Through experience, teachers also possess normative and age appropriate behavioral knowledge bases which influence their ratings. For example, teachers will expect hyperactive behaviors to decline with age (Achenbach & Edelbrock, 1981).

While rating scales remain influential in the diagnoses and classification of ADHD, what can be said of the processes which contribute to their formulation? Ideally, a rating scale or behavioral checklist will be constructed to be particularly sensitive to specific disorders. There exist a variety of statistical techniques which isolate influential "core" characteristics. Perhaps the most commonly used, at least in the social sciences, is factor analysis. The purpose of this technique is to, "find demensionality in a set of correlations; in classification studies the data base typically constitutes quantitative scores pertaining to observed or rated behavioral features" (Hinshaw, 1987). When we say demensionality we refer to an approach where key factors are assumed to be distributed continuously as apposed to a categorical approach where cases are held to constitute discrete types or classes. However, in recent years some researchers have attempted to merge these two models. It is argued that these may lead to more meaningful hybrid classicatory efforts (Blashfield & Draguns, 1984; Skinner, 1981).

While some papers have reviewed as many as 10 to 15 popular rating measures of ADD and hyperactivity, (Edelbrock & Rancurrelo, 1985), arguably the most common are the Connors' Behavioral Questionnaires. With its parent and teacher versions, the Connors' scales are supported with good concurrent validity and significant correlations with other rating scales and criterion measures. Many studies have shown the scales to discriminate significantly between normal and ADHD samples (Klein & Young, 1979; Werry, Sprague, & Cohen, 1975; Zentall & Barack, 1979). The scales have also been widely used as dependent measures in double blind placebo drug trials. They have also been show to be sensitive to drug effects (Barkley, 1977; Connors & Werry, 1979).

The Connors' scales have been translated into several languages and used in both research and clinical practice in Great Britian (Thorley, 1983), West Germany (Sprague, Cohen, & Eichlseder, 1977), Canada (Trites, Dugas, Lynch, & Ferguson, 1979), New Zealand (Werry & Hawthorne, 1976), and Australia (Glow, 1981).

In spite of the advantages and wide uses of these and other rating scales, there also exist a number of problems concerning reliability and validity. For example, Whalen and Henker (1976) showed low correlations between rated and observed behaviors. They support other arguments that while ADHD has been based on summed ratings from a list of behavioral items, correlations between individual behavioral items rated by the teacher with actual observations of those behaviors tend to be low (Blunden, Spring, & Greenberg, 1974). However, Zentall and Barack (1979) have argued that this may be due to flaws in the time-sampling methodologies used. They argue these approaches fail to account for situational moderators inherent in proposed behaviors.

Another criticism of rating scales is that they tend to be unstable over time, (i.e. unreliable). Werry and Sprague (1974) have demonstrated a "practice effect" where ratings are influenced by factors other than the observed behavior. For example, when asked to rate a single child or particular group of children before and after some intervention, a teacher may become more sensitive to their behaviors. Sandoval equated this to the "Hawthorne" or "Placebo" effect where the placebo group (i.e. second rating) is rated as improved because of teacher anticipated treatment gains (Sandoval, 1977).

Yet another criticism is poor interrater reliability (Whalen & Henker, 1976). While they argue correlations rarely reach r=.40, they also qualify their criticisms by admitting that childhood behavior varies across situations. "The question of interrater reliability might be answered more clearly if the context, the familiarization time with involved children, and the role of the observer (e.g., teacher, parent, counselor) were held constant (Zentall & Barack, 1979).

One final criticism involves the subjectivity inherent in all teacher and parent judgments. Many are not comfortable with diagnoses made without "hard, unequivocal, medical or laboratory findings" (Sandoval, 1977). Without this it becomes difficult to determine if one sample of subjects is comparable to another.

Our diagnoses must achieve homogeneous unity before we can ever expect to generalize our theories into real-world applications. However, a reply of a rating scale supporter has been that "...judgments are the stuff of which all diagnoses are eventually made, even in medical disciplines where laboratory based information is more readily available" (Connors, 1986).

Neuropsychological Assessment

Originally neuropsychological tests and batteries were largely concerned with the diagnosis and location of brain damage (Chadwick & Rutter, 1984). As researchers became more aware of the range of perceptual, psychological and behavioral sequelae inherent in neurological conditions neuropsychological batteries came to be used to help better integrate behavioral and cognitive performance with pathology.

With much of the work pioneered by Halstead (1947) and Reitan (1964, 1968), neuropsychological tests have played important roles in MBD and ADD syndrome definition. They have been useful in isolating specific cognitive, motor, perceptual and language deficits shown to occur in different reading, spelling and language disabilities (Petrauskas & Rourke, 1979). They have also been used in conjunction with neurological scans to help isolate lesions (Golden, Moses, Fishburne, Engum, Lewis, Wisniewski, Conley, Berg, & Graber, 1981), while also providing basic information on the functional integrity of the cerebral hemispheres (Boll & Barth, 1981).

Some neuropsychological features used to index brain dysfunction include inferior visiospatial skills relative to verbal skills, and wide disparity in general cognitive skills. These are evidenced by large verbal-performance discrepancies on the Weschsler Intelligence Scale for Children (WISC), and/or by scattered scores across subtests (Rutter, Graham, & Yule, 1970). Other neuropsychological measures include category tests to assess tactual performance, motor and speed tests given with tactile and kinesthetic cues, the Seashore Rhythm Test for non-verbal auditory perception and attention, the Trail-Making Test which assesses an individual's speed in visual scanning, and the ability to progress in sequence, grip strength assessment by a hand dynamometer, an aphasias screening inventory, the Wide Range Achievement Test, and various measures to evaluate sensory perception (Reitan & Davison, 1974).

Pediatric neuropsychological assessments provide detailed and standardized quantifications of performance that are not dependent on clinical judgments. They specify deviation limits from age-matched norms. They also provide a useful index to change, for example, recovery following injury or surgery, or perhaps in response to educational intervention. However, these measures do not assess the quality and type of neurodevelopmental dysfunction, nor do they take into account environmental, genetic and other causes that are always crucial in clinical appraisal (Chadwick & Rutter, 1984).

Neuropsychological assessment has been called naive on the grounds that it assumes a given measure or set of measures will provide clinical uniformity on an extremely complex set of neurological and psychological conditions. At least in psychological terms, no single measure of brain function should ever stand alone. Some of the earlier batteries were criticized as providing vague and undifferentiated diagnoses of pathology verses non-pathology with few or no specific statements of causality (Meyer, 1957).

As Boll (1978) argued, brain damage does not necessarily manifest itself behaviorally. Many types of brain pathology represent static conditions with relatively few functional or behavioral sequelae. It has also been shown that psychosocial stressors play important roles (Benton, 1974). As Chadwick & Rutter (1984) point out, the identification of brain pathology and the verification that the pathology is causing the clinical symptoms constitutes two very different issues.

Another criticism put forth by Herbert (1964) is that they lack a well agreed upon theoretical base. How can we accurately diagnose pathology when we are not sure what normal is? When an abnormal finding or pattern emerges our approach is to pattern the responses to a normal or pathological model.

When clinical comparisons are made to normative scores they may not be applicable to the clinical situation in which tests of this nature are to be employed. In other words, it makes no sense to administer a neuropsychological test to a child with cerebral palsy. Instead, these measures are most often used when neurological symptoms are ambiguous, or are normal in spite of other reasons for suspecting an organic malfunction. These are precisely the cases which apply to MBD and ADHD. Therefore, for the so called minimal dysfunctional cases the neuropsychological tests may be the least effective. While some applications have proven useful in differentiating learning disabilities, we are still far from understanding which brain functions the tests reflect.

According to Rutter (1984) the tests are most often used when we strongly suspect a cognitive deficit, but are uncertain as to whether or not the deficit reflects organic brain dysfunction. Does this not sound familiar? If neuropsychological batteries are to eventually help to clarify these situations, we should be well on our way to verifying the existence of an organic etiology.

Neurological Soft Signs

A soft sign can be defined as a "nonnormative performance on a motor or sensory test identical or akin to a test of the traditional neurological examination, but a performance that is elicited from an individual who shows none of the features of a fixed or transient localizable neurological disorder." (Shaffer, O'Connor, Shafer, and Prupis, 1984). Some of the soft signs include mirror movements, tics, ataxia, choriforme movements, dysmetria, dysdiadochokinesia, extended deep tendon reflexes, dys-graphesthesis and astereognosis to name a few.

A number of investigators have shown increased numbers of soft signs in clinical comparisons of MBD and hyperactives to controls (McMahon & Greenberg, 1977; Rasmussen, Gillberg, Waldenstrom, & Svenson). Other investigators have found within group differences in the same directions among psychiatric inpatients and children attending a learning disability clinic versus children diagnosed with more severe disorders showing more soft signs (Kennard, 1960; Boshes & Mykelbust, 1964).

Although we still do not understand their etiology, there is a certain attraction to an "objective" neurological sign which indicates some level of damage or dysfunction. These types of findings have influenced the emergence of the

MBD concept. However, because they also lack a well agreed upon methodological base, diagnostic emphasis has begun to shift from strictly medical and organic models to psychological and cognitive models.

Because soft signs occur in significant numbers in the general population, and their existence is often transient, many have criticized their clinical utility (Schmitt, 1975; Ingram, 1973). Others criticize the rater bias and low inter-rater agreement in the studies supporting soft sign differences (Shafer, Shaffer, O'Connor, & Stokman, 1984). Others have reported no differences at all (David, Clark, & Voeller, 1972)

It appears that neurological soft signs may be related to cognitive dysfunction, learning disabilities, and psychiatric disturbance. However, specific relationships remain unwarranted. Soft signs probably have many origins and mean a great many things, not all of which are necessarily specific to ADHD. According to Kinsbourne (1973), a reliance on soft signs "blurs essential distinctions. If we bracket lack of dexterity and hyperactivity together as signs of MBD, we will soon be treating clumsiness with stimulant drugs".

The correlational nonspecifiety may very well argue that MBD, ADHD etc., of which soft signs may be an indicator, should best be regarded as a kind of nonspecific etiological influence that may increase vulnerability to psychiatric disorders, but does not necessarily always precede them.

CHAPTER IV

PSYCHOPHYSIOLOGY OF ADHD

During the past 25 years there has been a multitude of research investigating proposed psychophysiological differences between attention deficit and hyperactive children versus controls. This has been especially true in reference to predicting improvement due to stimulant medications (Barkley, 1976, 1977; Connors, 1972; Hastings & Barkley, 1978; Werry, 1970; and Yellin, 1978). Much of the debate has centered around theoretical postulates of arousal, in terms of the behavioral, autonomic, and central effects.

Behavioral arousal has been used synonymously with activity level. Autonomic arousal refers to the activation of certain regulatory functions including heart rate, skin conductance, and skin temperature. Cortical arousal refers to the activation of cortical neurons by diffuse arousal systems thought to be located subcortically. According to Rosenthal and Allen (1978), because both cortical and autonomic arousal are mediated at least in part by the reticular activating system (Lynn, 1966), they can be collectively referred to as physiological arousal.

Early investigations (Freiberg & Douglas, 1969; Laufer, Denhoff, & Solomons, 1957) have argued the central nervous system (CNS) of hyperactives is overaroused. Given this, behavioral overactivity and inattentiveness will follow. The beneficial effect of stimulants is construed as paradoxical or in this case sedative (Wender, 1971). Other overarousal supporters argue the stimulant effects stem from an augmenting of cortical inhibitory processes (Laufer, Denhoff, & Solomons, 1957).

Other more current researcher supports an underarousal theory of CNS function in ADHD (Rosenthal, 1973; Satterfield, 1976; Satterfield, Cantwell, and Satterfield, 1974). They argue the high level of activity stems from a stimulus seeking nervous system. These children interact with the environment as they do in order to produce adequate levels of stimulation. Stimulant effects are easily explained as energizing the CNS thereby decreasing the level of motor activity.

Yet another recent theory supported by several researchers, (Satterfield, Atoian, Brashears, Burleigh, & Dawson, 1974; Wender, 1971; Zentall, 1975; and Zentall & Zentall, 1976) argues for a combination of the previous two theories. In other words, some affected children display levels of arousal at either extreme. The overaroused children respond paradoxically to stimulants thereby lowering CNS arousal, while the underaroused are energized by the medications by showing elevations on CNS measures. In both cases, the deviant arousal systems are normalized.

What attracts many to this line of thought is that it may help to explain some of the variability of drug responders in this population while at the same time help rectify some of the conflicting results found in psychophysiological studies of hyperactivity. However, as Hastings and Barkley (1978) point out these hypotheses do not address issues of "non-responders" to stimulant medications.

While in part supporting the latter theory, Wender (1971, 1972) proposed two congruent theories of the hyperkinetic syndrome. He argued that hyperkinesis is a disorder of arousal and reinforcement. Inappropriate behaviors stem from the child's inability to learn through reinforcement. Stimulants increase the experience of "pleasure and pain", which themselves lead to more efficient learning (Wender, 1972).

He provides neuroanatomical explanation by postulating primary deficits in limbic areas thought to be implicated in reinforcement. These include the medial forebrain bundle and hypothalamus. Physiological explanation stems from deficits in metabolism of monoamine transmission, specifically norepinephrine (Wender, 1972).

Yet another set of psychophysiological theories touched on earlier argued that defective inhibitory cortical processes shorten attentive mechanisms (Laufer, Denhoff, & Solomons 1957; Connors, Eiserberg, & Sharpe, 1964). External stimuli stimulate internal drives which are themselves not adequately suppressed. Therefore it is more likely the child's behavior will be impulsive. Stimulants act to increase inhibitory control thereby improving attention (Connors, Rothschild, Eisenberg, Schwartz, & Robinson, 1969).

Douglas and her colleagues proposed a similar theory composed of what she called the child's ability to "Stop, look, and listen". She argued this set of abilities involves an interaction of attention and inhibitory control and is deficient in hyperkinetic children (Douglas, 1972).

Finally, there is Dykman, Ackerman, Clements, and Peters (1971), who argued there exists a forebrain inhibitory system that exerts control over brain-stem reticular formation and diencephalic switching mechanisms of the thalamus. Hyperkinetics display deficient inhibition, which leads to inefficient switching patterns and consequently to poor attention. There also exist diffuse discharge patterns which activate motor centers and result in restlessness. They further argued that the "hyperactive learning-disabled" child is so overattentive to the environment, that he appears easily distracted. However, there also exists the hypoactive learning-disabled who are underattentative to the environment due to similar sporatic discharges, although not affecting motor centers. In both cases deficient inhibitory signals lead to poor performance on attention tasks (Rosenthal & Allen, 1978).

As indicated there have been many psychophysiological approaches to the etiology of ADHD, some complimentary, others contradictory. In light of the controversies it seems appropriate to briefly investigate some of the empirical measures which have influenced these models.

A popular experimental approach has been to compare ADD and hyperactive children with controls on peripheral measures of arousal, such as skin conductance and heart rate. The comparisons are made both during resting periods (tonic arousal) and in response to stimulation (phasic arousal). There has been little evidence suggesting tonic arousal differences. However, some studies investigating responses to target stimuli (i.e., reaction time) have shown differences (Hastings & Barkley, 1978; Firestone & Douglas, 1975; Satterfield & Dawson, 1971). Hyperactive children show smaller responses on electrodermal measures and smaller cardiac decelerations on phasic responses to signal stimuli. Also, stimulants have been found to increase autonomic arousal indices, while also improving attention (Campbell & Werry, 1986).

Most of the evidence to date supports underarousal theories. Generally, hyperkinetics display lower levels of autonomic activity and reactivity. Reaction times and orienting responses to target stimuli tend to take longer, while habituation time is faster (Cohen & Douglas, 1972). However, as noted earlier, methodological concerns limit the generalizability of many of these studies. In fact, some researchers argue the behavioral aberrations in hyperkinesis could not stem from autonomic and arousal dysfunctions because tonic levels are generally not significantly different (Stamm & Kreder, 1978). Instead arguments stem from demonstrations that neuronal processes subserving attention involve cerebral cortex (Luria, 1973). Also, the dysfunctional autonomic reactivity may be the consequence of deficient modulation of the cortical arousal system via descending pathways from cortex (Stamm & Kreder, 1978).

Another point worth mentioning is that the inability of these children to maintain attention to an experimental task may be a function of lowered motivation in response to no reinforcement. Therefore, in reference to psychophysiological studies, we must ask whether low levels of physiological responding "cause" inattention and poor performance, or is the inattention secondary to low reinforcement, which itself causes lowered physiological arousal and response rates, and poorer performance?

CHAPTER V

ELECTROPHYSIOLOGY OF ADHD

Electroencephalography

With its inception by Hans Berger in 1929, the electroencephalogram (EEG) has been used in clinical medicine as a neurological diagnostic for a host of conditions and diseases including the epilepsies, tumors, cerebral vascular and other circulatory disorders, infectious disorders, and developmental and degenerative disorders (Berger, 1929; Kooi, 1978). The EEG recording measures extremely minute (5 to 100 uv) bioelectric oscillating potential differences between two points. These points can be located on the head surface or in intra-cerebral or depth locations within the nervous system.

Physiology of EEG

The electrophysiological current emanates off cortex and is believed to flow between fluctuating dipoles which themselves are formed of cortical cell dendrites and cell bodies. Multiple arrays of densely packed dendrites line the cortical surface. As the excitatory and inhibitory endings of the cell dendrites become active the cell becomes either hyperpolarized, meaning less excitable, or hypopolarized, meaning more excitable. These dipolic fluctuations can occur in either a synchronous or desynchronous fashion.

Synchronous activity is believed to be affected by 1) the influence of signals stemming from thalamo-cortical projections, originating in the pontine portion of the ascending reticular formation (Magnus, 1954), and 2) the synchronizing influence from neighboring parallel fibers (Chusid, 1985). One of the corresponding synchronous or rhythmical signals is known as alpha frequency. This rhythm fluctuates between 8 to 13 cycles per second or hertz. It is commonly seen during eye closure while the individual is relaxed and awake. Anderson and Anderson have argued: "the generator of rhythmic activity is localized in the thalamus. From this source, rhythmic discharges propogate along thalamocortical axons to induce activity in cortical cells" (Anderson & Anderson, 1968). They argue that the generator or as they call it "pacemaker" of the rhythmical oscillations lies in the thalamus, while the generator of electromotive forces of the cortical waveforms or the "battery" resides in the cortex (Anderson & Anderson, 1968; Albe-Fussard & Buser, 1955).

It has been shown that when dipolic dendritic oscillations are blocked due to afferent stimulation, a desynchronous usually low voltage signal emerges. It has also been proposed that arousal mediated through the ascending mediodiencephalic reticular formation has a desynchronous effect (Moruzzi & Magoun, 1949). It is believed these rhythms are produced by stimulation of specific sensory pathways up to the level of midbrain (Chusid, 1985). It has also been shown that other sensory stimulation and mental concentration can also desynchronize the electrical activity (Neidermeyer & Lopes de Silva, 1981). This has been referred to as the arousal or alerting response since dyschronization can be produced by sensory stimulation and is correlated with an aroused or alert state (Chusid, 1985). These findings which go back to Berger's original work in the 1920's and 30's, lay the foundation for some of the first reliable efforts correlating electro-physiological signals with mental processing (Berger, 1929).

EEG Applications

The EEG is obtained by connecting the recording electrodes to an ink writer via several stages of amplification; these stages magnify the potential differences between two adjacent electrodes (bipolar recording) or between a single electrode and an inactive electrode (monopolar recording). The amplification process is similar to a stereo receiver amplifying an incomming radio signal. The emerging signals oscillate in human frequency ranges between approximately 1hz and 50 hz. These frequencies have been divided into four commonly known band widths; namely, delta (.1 to 3.5 hz), theta (4 to 7.5 hz), alpha (8 to 13hz), and beta (above 13 hz). The following sections will briefly mention the neurological and proposed psychological characteristics associated with each frequency.

Bio-behavioral Correlates of EEG Frequencies

Alpha Rhythm

The alpha rhythm was discovered by Hans Berger in 1929 when he noted that the rhythmical signal was blocked or desynchronized following sensory stimulation (Berger, 1929). According to The International Federation of Societies for Electroencephalography and Clinical Neurophysiology, alpha rhythm can be defined as follows:

> "A rhythm at 8 to 13 Hz occurring during wakefulness over the posterior regions of the head, generally with higher voltage over the occipital areas. Best seen with eyes closed and under conditions of physical relaxation and relative mental activity. Blocked or attenuated by attention, especially visual and mental effort" (IFSECN, 1974).

Theta Rhythm

Theta was named by Walter & Dovey, 1944 to allude to its proposed thalamic origin (Walter & Dovey, 1944). The

Germans have called it "Zwischenwellen", meaning intermediate waves (Neidermeyer, 1987). In adults theta rhythms are primarily seen during drowsiness and stage 1 sleep. Only trace levels should be present during normal wakefulness.

In children theta frequencies occur more frequently. Generally the background posterior rhythms increase in frequency as the child ages. Some argue that 6 to 7 Hz background activity predominates during the second year of life with a shift to 7 to 8 Hz during the third year (Eeg-Olofsson, 1971). Others argue a frequency range from 5 to 10 Hz can be observed during the second year (Lindsley, 1939). By age 10 the now posterior alpha rhythm reaches a mean frequency of approximately 10 Hz. This usually remains until old age when the background rhythms begin to slow.

Delta Rhythm

There is a well agreed upon relationship between amount of slowing and level of drowsiness and stage of sleep in normal adults (Rechtschaffen & Kales, 1968). Delta activity is commonly seen in deeper sleep stages. In fact stage 3 is in part defined as between 20 and 50% delta while stage 4 is defined as over 50% delta (Rechtschaffen & Kales, 1968). Occasional bursts of delta are also seen during stage 2 sleep. These are known as K-complexes. Otherwise delta activity is rarely if ever produced in a normal awake adult.

As with theta, delta activity is more commonly seen in children, especially during infancy. There are occurrences of arhythmical and rhythmical posterior slow activity which are considered normal variations in children. However, according to Neidermeyer, the normal maturational process beginning at the second decade of life is characterized by the gradual disappearance of intermixed posterior slow activity (Neidermeyer, 1987).

Beta Rhythm

Beta activity is found in most healthy adults. Its voltage rarely exceeds 30uv and is found more in frontal and central locations. Central beta is also related to Rolandic Mu rhythm which can be blocked by tactile stimulation, motor activity, or interestingly enough, the thoughts of motor activity. Since Rheinberger and Jasper's original experiments, the terms "low voltage fast beta" and "desynchronized cortical activation" have been used synonymously. (Rheinberger & Jasper, 1937). Beta activity generally incorporates those frequencies which appear following sensory stimulation and alpha attenuation. Its frequency range is larger than any other band with an unlimited upper end. However, true neurological rhythms measured topographically rarely exceed 32Hz.

Spectral Analysis

In more recent years researchers have devised computational programs which perform quantitative manipulations of EEG signals which in turn provide more objective interpretations of waveform morphology. The computations involve sampling, filtering, classification, and frequency analysis of EEG signals (Kooi, Tucker, & Marshal, 1978). All of these techniques are known collectively as spectral analysis.

To describe, the signal is initially filtered at the desired upper and lower ends of the frequency spectrum so as to measure only those frequencies desired. Sampling is performed to allow the conversion of the continuous (analogue) signal into discrete, quantitized (digital) samples, (i.e. analogue to digital conversion). The sampling rate, which usually ranges between 64 and 256 samples per second, must always be set at least twice that of the highest filtered frequency to insure that all of the remaining frequencies are represented accurately. For example a sampling rate of 64 sps will not accurately represent the higher beta frequencies. However, smaller sampling rates require less computer storage space. During the analog to digital conversion the EEG signals are converted into numeric values and then stored in bins representing each location of recording.

Fourier Transform

In the final stage, analyses are performed which determine the frequencies present in each signal as well as the amplitudes or power of the frequencies. This is carried out by transforming the stored signal (the length of which is prespecified by epochs or time segments) into a new form known as the frequency or Fourier transformed signal.

The process known as Fast-Fourier Transform (FFT) essentially filters the stored signal through a set of band-pass filters whose outputs are accumulated during the passage of the signal through the filters. Each accumulated filter output then becomes a numeric point in a transformed plot or curve whose coordinates represent the amplitude and frequency of the signal. Mathematically, this is accomplished by multiplying the stored sample of signals by a stored sample from a sine wave at a frequency of interest and accumulating the output. This will be done for each frequency band (delta, theta, alpha, etc.) of interest, and usually for as many frequencies as possible so as to provide what is known as a quasi-continuous spectrum of frequencies (Kooi, Tucker, & Marshall, 1978). Once EEG data have been transformed into the frequency domain and quantified into numeric form, it acquires statistical relevance. Individual and group comparisons can be performed and significance tested.

Because of the neurological utility and the relationship between neurology and psychiatry, researchers have attempted to draw electrophysiological relationships between frequency and locality of EEG signals and various psychiatric disorders. To recount, by recognizing theories arguing for a pathological continuum as the etiological basis of psychiatric phenomenon, it makes sense to test hypotheses of neurological or possibly electrophysiological states affecting emotional, behavioral, or even so called educational disabilities.

The electoencephalogram has had a long and somewhat controversal history in the diagnosis of child psychiatric disorders (Ritvo, Ornitz, Walter, & Haley, 1970). Investigators have explored hypotheses that MBD, LD, ADD etc. may represent pathological deviations from normal brain function. Most of the earlier studies have investigated group differences in frequency and/or locality of EEG signals. Some common reports have included excessive levels of slow frequency activity in clinical samples (Capute, Niedermeyer, & Richardson, 1968; Cohn & Nardini, 1958; Jasper, Solomon, & Bradley, 1938; Kiloh & Osselton, 1961; Klinkerfuss, Lange, Weinberg, & O'Leary, 1965; Knott, Platt, Ashby, & Gottlieb, 1953; Pavy, & Metcalf, 1965; Stevens, Kuldip, & Milstein, 1968; Werry, Delano, & Douglas, 1964; Winkler, Dixon, & Parker, 1970). Other studies have reported less beta in clinical subjects (Grunewald-Zuberbier, Grunewald, & Raske, 1975; Callaway, Halliday, &

Naylor, 1983. Still others have reported less alpha attenuation or blocking in response to external stimuli (Fuller, 1977; Satterfield, 1973).

However, one commonality found in most of the earlier studies is that group differences were based upon qualitative interpretations of raw EEG signals. Investigators visually inspected paper tracings and made qualitative judgments based on general EEG morphology. No matter how qualified the judges, this technique will always be more subject to rater bias. For this reason the methodology of many of these studies has been criticized (Ferguson & Pappas, 1979; Paine, Werry, & Quay, 1968).

More recent efforts employing previously discussed techniques have reported findings similar to earlier studies. After reviewing the literature there appear to be three commonly reported electroencephalographic relationships which reappear in studies comparing ADD, LD, dyslexia etc. populations with age matched controls. These include 1) increased percentage distributions of 2 to 7.5 hertz frequencies, (delta and theta) in clinical samples 2) smaller percentage distributions of faster (beta) frequencies (above 13hz) in clinical samples, and 3) less alpha attenuation or blocking in response to external stimuli in clinical samples.

The following sections will be devoted to key papers reporting such findings with special emphasis on the integration of conclusion with existing research and the use of new applications related to EEG. This will be followed by a thesis proposal and presentation of research using a new technique to investigate a sample of male children diagnosed with Attention-deficit Disorder without Hyperactivity.

EEG Correlates of ADHD

Excessive Slow Wave

By far the most common reports in clinical to normal comparisons are excessive amounts of slower EEG frequencies, specifically in the 2 to 7.5 hertz band widths (i.e. delta and theta frequencies). Much of the research reports non-specific generalized slowing across all recording locations. For example, (Matousek, Rasmussen, & Gillberg 1984) reported varied amounts of slow frequencies in children as a function of severity of diagnosis. Those children with multiple diagnoses of MBD and psychiatric abnormality showed more deviation on what they call a normality ratio than did children diagnosed with single disorders. Again we note the recurring theory of a neuro-pathological continuum. Following discriminant function analysis the authors were able to correctly classify 19 of 27 (70%) of MBD subjects and 42 of 50 (84%) of control subjects.

However, a methodological concern of this study was that the sample sizes of some of the sub-populations (i.e.

subjects with so called pure ADD, mental retardation, and motor/perceptual dysfunction were 11, 1, and 3 respectively. These are not of adequate size to warrant inter-diagnostic differentiation.

Other reports of excessive slowing stem from the work of E.R. John and colleagues. While having published extensively in this area, they support the development of a screening battery called "neurometrics" (Prichep, John, Ahn, & Kaye, 1984). This approach incorporates a battery of neurophysiological measures of EEG and evoked responses. Relevant measures are subjected to Z transformations relative to age matched normative values. Clinical relevance is assessed by noting the amount and locality of deviation from the norm (Ahn, Prichep, John, Baird, Treptin, & Kaye, 1980).

To describe in more detail, two central tenants of the neurometric evaluation are measures of maturational lag and developmental deviation. To paraphrase from Rutter:

> For each head region, the square root of the sum of squares of the Z scores for relative or percentage power in the four frequency bands is calculated. This they call a "vector sum". The normal distribution of vector sums across all head locations has been previously calculated as a function of age. This consists of a large sample from the normal population which has been stored in data-base format. The clinically obtained vector sums are computed by an algorithm which calculates the vector sum that the same set of measures would yield when different age values are inserted into the equations. If there is an age for which the vector sums would be within the normal distribution, this will be defined as the physiological age of that particular location. The difference between the physiological age and the chronological age of the patient is defined as the

> maturational lag for that location. On the other hand, if there is no age for which the obtained Z scores would yield a vector sum within the normal distribution, that location is defined to show developmental deviation. (Rutter, 1984).

John and his colleagues have found that different psychiatric and behavioral disorders can produce distinctive neurometric profiles. For example, based upon preliminary studies LD samples are better characterized by maturational lag, while patients with better defined neurological conditions are more accurately characterized by developmental deviations. While further validation is needed, neurometric evaluations could be potentially useful in the large scale screening of, and early intervention in, at risk populations (Rutter, 1983) p. 234.

Another important contribution to the study of quantitative EEG in child psychiatry came when investigators began comparing clinical and normal samples while subjects were engaged in cognitive activities (i.e., phasic arousal). Simply put, the idea was to electrophysiologically study the child when he or she activates or stresses those cognitive faculties which behaviorally and academically set them apart.

This notion is similar to the cardiac stress model where few discrepancies are found during resting and inactive periods, however, when stressed the organism displays pathological symptoms associated with the disorder. In fact, a similar model is used in EEG in the diagnosis of seizures. It is found that when patients hyperventilate or are sleep deprived (approximately 24 hours) their EEG, if seizure prone, displays clinical symptomatology. Could the same be true for educational disabilities?

An immediate problem encountered by researchers is how to limit the contaminating signals which are generated by muscle tension and eye movements. When performing educational testing certain movements (especially the eyes) are obviously necessary. Because EEG is extremely sensitive to neck, facial and eye movement, it can become difficult to isolate true neurological activity from that which is generated from artifact. Moreover, when working with educationally handicapped children who are performing tasks which are difficult for them, the issue becomes even more important. Fortunately, EEG instrumentation has low and high band pass filters which restrict extreme frequencies at both ends of the EEG spectrum. These extreme frequencies are caused by muscle and eye movement. Also a trained EEG technician will be capable of distinguishing artifact generated signals from non-artifact generated EEG.

Another set of papers which incorporated this notion of cognitive stressors was the research of Frank Duffy and colleagues. Their interests were in using topographic brain mapping of EEG and evoked responses in comparing children with dyslexia to normals. Their results indicated that the dyslexic sample produced more theta and alpha activity in bifrontal, left temporal and left posterior regions. The later two regions are thought to be more involved in reading and speech. Also, while differences were noted during resting conditions, more differences were seen during cognitive activation. The authors suggest that excess theta and alpha in dyslexics indicates relative cortical inactivity or idling of underlying cortex (Duffy, Denckla, Bartles, & Sandini, 1980; Givens, Zeitlin, Doyle, Yingling, Schaffer, Callaway, & Yeager, 1979).

Another paper by Duffy using the same test conditions found that by using discriminant function analysis, they were able to correctly classify 80 to 90% of subjects in each group. They argued that dyslexia involves multifocal processes integrating both hemispheres and is detectable during rest and especially during complex test states (Duffy, Denckla, Bartles, Sandini, & Kiessling, 1980).

Numerous other researchers have reported excess slowing in clinical to normal comparisons. Flynn and Deering, 1989 found excessive left hemisphere theta in dyslexic children while engaged in reading and spelling tasks. An interesting aspect of this study was that even more differences were found when clinical subjects read at what they called frustration levels as opposed to easy reading levels. Their data support a theory by Zaidel (1987) which argues the left hemisphere of children with dysedetic developmental dyslexia,

> "exercises maladaptive control of error detection and correction procedures, interfering with right-hemisphere participation. It may be that bilateral integration of mental activity is needed for efficient completion of tasks, with overdevelopment as well as underdevelopment

of a cerebral region or neurophysiological system leading to disrupted performance" (Flynn & Deering, 1989).

Other researchers including Lubar, Bianchini, Calhoun, Lambert, Brody, & Shabsin, 1985, found increased theta frequency in LD subjects. After performing discriminant function analysis on fronto-temporal locations, they were able to correctly identify 81% of normals and 79% of LD subjects. They also had subjects perform easy and hard tasks and again found more differences during hard tasks especially for percent power analyses.

Deficient Beta Activation

The next most common finding in clinical to normal comparisons is a lack of desynchronous fast frequency EEG commonly known as beta activity. It has long been recognized since Berger's work in the 1920s and 30s that general sensory input blocks or desynchronizes the rhythmic oscillating signals associated with relaxed wakefulness (Berger, 1929). The result is desynchronous low voltage, fast frequency signals. In fact these changes often result (at least in normal subjects) by simply opening the eyes. With this as a foundation, researchers began associating beta activity with the alerting and arousal response (Rheinberger & Jasper, 1937). Beta activity has since come to be associated with cortical engagement and mental processing (Lindsley, Bowderm & Magoun, 1949).

Beta deficiencies in clincial samples have been reported by Dykman, Holcomb, Ogelsby, and Ackerman, 1982. They computed averaged spectral waveforms on four groups of subjects (normal, hyperkinetic, learning deficient, and mixed), then subjected these waveforms to a principle component analysis (PCA). They found that component 1, which had primary loadings between 16 and 20 hz (beta) was significantly lower than the control group ($p<.05$), indicating deficient cortical involvement in hyperactive and learning disabled children. (Dykman, et.al., 1982).

Lack of Alpha Attenuation

As noted earlier, phasic changes in EEG can be elicited by presenting novel stimuli. The resulting orienting reaction produces a lessening or complete blocking of alpha activity. This has been referred to as the alpha attenuation response (AAR) (Rosenthal & Allen, 1978). Berger discovered this process accidently by assuming the influx of light would stimulate the production of more action potentials and therefore enhance the voltage of the EEG signal. Instead a reduction occurred which he later theorized was due to a zone of inhibition surrounding the area of excitation by the afferent stimulus (Berger, 1933).

Researchers have shown that hyperkinetics exhibit longer latency AAR's in response to novel stimuli (Fuller, 1977; Grunewald-Zuberbier, Grunewald & Rasche, 1975; Milstein, Stevens & Sachdev, 1969; and Satterfield, 1973). Duffy has also reported excess alpha production in clinical samples during cognitive tasks (Duffy, 1980). All of these papers support a common conclusion that clinical subjects have lower overall cortical arousal.

While some argue that too much variability exists in research investigating EEG correlates in child psychiatry, (Paine, Werry, & Quay, 1968; Ritvo, Ornitz, & Walter, 1970), it can be argued that common themes have emerged. For example, the three most common findings all suggest in one form or another that clinical samples are not cortically engaging during cognitive states. Differences reported as excess slow wave, lack of beta activation, and lack of alpha inhibition all support this theory.

The question remains, however: Where does the pathology lie? Which finding(s) if any represent the behavioral and academic deficits? Also, as Dykman et.al. points out, "Are the observed electrocortical variations related to the cause or do they simply represent yet another manifestation of the overt disorder?" (Dykman, et.al., 1982). Perhaps, as some would argue, the answers lie elsewhere, or perhaps other measures complimentary to the EEG, such as evoked responses, will help better isolate neurological correlates.

Event-related Potentials

This is a measure in electrophysiology dedicated to the detection, quantification, and physiological analysis of brain electrical activity that is triggered by the occurrence of particular events or stimuli (Lopes de Silva, 1987). Event-related potentials (ERP's) also known as evoked potentials (EP's) are signals generated by neural populations that become active time-locked to the stimulus. EP's can be extracted from raw EEG through a process known as signal averaging or measured alone as those post-stimulus waveforms occuring in a time range between 0 and 1000 milliseconds.

Evoked Postentials can be elicited from any measurable afferent system. Some of the more common EP's include visual evoked responses (VER), brain-stem auditory evoked responses (BAER), and somato-sensory evoked responses (SER). Researchers have standardized the morphological components of each potential through normative data bases, and have since established neurophysiological bases for each component. For example, based upon the morphology and locality of deviation in a patient's VER, the clinician can determine the location and extent of damage to the optic nerve. EP's are also used in inter-operative monitoring to provide the neurosurgeon or orthopedic surgeon information on the functional integrity of various afferent channels.

However, since the emergence of magnetic resonance imaging (MRI), EP's are used less to locate structural lesions.

It has been shown that early components of the EP's (pre 100 ms) represent axonal potentials generated principally from subcortical fiber tracts representing the specific sensory pathway stimulated (Krumholz, 1987). Because the early components are more strictly reactionary, there is less between subject variability, therefore they are more easily and reliably standardized.

The late components of the EP's (post 200 ms) are believed to be derived from potential changes from apical dendrites of the cortex, similar to the EEG (Krumholz, 1987). Researchers in experimental psychology and cognitive neurophysiology have argued for some time that these components represent cortical processing of sensory input (Dauna & Karrer, 1984; Naatanen & Michie, 1979).

As with EEG, EP measures have also been attempted under more complex test conditions, again under the assumption that complex test states stress or tease out relevant clinical differences. The amplitude and latency of various late components such as the P2 and P3 (positive post-stimulus deflections occurring at approximately 200 and 300 ms), have been investigated as potential neurophysiological correlates of ADHD and various learning disabilities (Loiselle, Stamm, Maitinsky, and Whipple, 1980; Lubar, Gross, Shively, & Mann, 1990; Satterfield, Sachell, Nicholas, & Backs, 1988).

Most studies report either a suppression of major late positive peaks in clinical subjects or longer latency peaks in clinical subjects. In both cases it is argued that deficient cortical processing is the result. Abnormally low voltage peaks associated with decreased cortical activity indicate clinical subjects do not discriminate and attend as well to novel stimuli (Satterfield, et.al., 1988). In another study LD subjects produced more behavioral errors, while at the same time showed more differences from normals during complex tasks (Lubar, et.al., 1990). As the cognitive tasks increased in complexity, LD subjects displayed significantly suppressed major positive peaks (ie. P300's).

However, due to the late component subject variability researchers have had difficulty in standardizing the latency and amplitude of various components. When group data are averaged the resulting waveform differences from one paper do not necessarily match those of another. In other words, the P2 and P3 components do not always fall at or sometimes even close to 200 and 300 ms respectively. Therefore it could be argued that clinical to normal comparisons do not provide reliable CNS indications of clinical pathology.

While more research is needed, EP's do provide CNS indications of functional processing. Many agree that P3 and other late components have great promise in the evaluation of cognitive dysfunction in children (Finley, Faux, Hutchenson, & Amstutz, 1985; Duffy, et.al., 1980). In fact, Krumholz argues, "The objective use of EP's to analyze cognitive processes to discern the electrophysiological correlates of cognition and perception as they relate to intellectual development may be the next frontier in electrophysiological testing in the nervous system" (Krumholz, 1987).

CHAPTER VI

PURPOSE OF THE PROPOSED RESEARCH

It is hypothesized that a sample of male right handed children (9 to 12 years) diagnosed with Attention-deficit Hyperactivity Disorder without hyperactivity, specific learning disability, or conduct disorder will reveal differences in topographic EEG distributions from an age-matched normative sample. It is further hypothesized that by performing academic activities (reading and drawing), the ADD sample will be further distinguished from controls.

Methods

Subjects

All subjects were male, right-handed, and between the ages of 108 and 155 months (9 to 12 years). All children were enrolled in school, however, those enrolled in juvenile, adoptive, or other similar agencies were excluded. All children were believed to have adequate familial and economic support. No family's income was at the poverty level, nor was any family receiving welfare.

All children with ADHD had been previously referred to one of two pediatric neurologists from local school districts with chief complaints of inattention and impulsivity. Subjects may have also been described as consistently being off task, unmotivated, daydreamers, and having poor compliance with instruction. However, no child displayed clinical symptoms of conduct disorder or specific learning disability either in classroom or home settings.

Upon medical examination ADHD subjects presented with no signs of gross neurological impairment. Nine of the 25 subjects presented with 2 or less neurological soft signs, including extended deep tendon reflexes (2+ DTR's), and mild gross motor clumsiness. No subjects presented with any other neurological soft sign. Connors' Parent and Teacher Behavioral Rating Scales were administered, with all ADHD subjects rated as significantly deviant. The ratings were 15 or greater, and equivalent to 1.5 SD's or greater on both measures (Connors, 1969, 1986). Specific behavior ratings assessing attention deficits without hyperactivity were used to calculate clinical significance. All experimental subjects had previously received a medical diagnosis of Attention-deficit Hyperactivity Disorder based upon DSM III-R criteria (DSM III-R, 1986). Any child diagnosed with any other neurologic or psychiatric disorder was excluded from the study. No child was taking any prescribed medications.

Control subjects were matched by every demographic variable. They were recruited through the same schools as the ADHD group. Interested school principals were instructed to randomly choose teachers to participate by having them choose between two and three children whose performance they believed to fall in the normal range. Both Connors' scales were administered with neither measure showing significance based upon the same clinical criteria.

Procedure

All testing took place in an accredited pediatric neurodiagnostic center during school hours. Subjects and parents were initially familiarized with the laboratory setting with all procedures explained and consent forms signed. Subjects were administered the Wide Range Achievement Test-Revised (WRAT-R, 1984). Parents were interviewed and questions pertaining to general attitude, school work, grades, and peer relations were asked. Next, the Wechsler Intelligence Scale for Children-Revised (WISC-

R) was administered, followed by a ten minute rest period (WISC-R, 1974).

The parents were allowed to view the next phase which included measuring and marking the cranium according to the international 10-20 system of electrode placement. The electrodes were attached with Nihon Khoden Elefix paste and reinforced with individual gauze patches over each electrode site. Gauze bandage was used as further reinforcement by lightly wrapping the child's head. These procedures were done to insure that the electrodes remained stationary.

A monopolar montage with linked mastoid reference was used along with an extra EOG electrode placed below the left eye. All impedances measured below 3 kohms. A Nihon Kohden EEG 4217 polygraph was used with low frequency filter set at .1 and high frequency filter at 70 hz. The sampling rate was 128 samples per second. The polygraph was interfaced with a DT-2901 data translation board located in a IBM PS2 Model 80. This performed an analog to digital conversion and fed the data into the Stellate Brain Mapping Program where further off-line analyses were performed (Stellate, 1990). Channel by channel calibrations were performed prior to the testing of each subject.

Subjects were seated in a reclining chair in a sound attenuated room. Five minutes of EEG was collected across each of three conditions; baseline, reading, and drawing. During each condition every effort was made to reduce artifact due to eye movement and muscle tension. During the first condition subjects were instructed to visually fixate for five minutes on a red dot placed 36 inches in front of them. They were instructed not to speak, and to remain still. For the next condition, subjects were given an educational reading assignment taken from a grade-appropriate text. The story was typewritten and single-spaced with pictures removed and placed on a lap desk. After five minutes the subject was asked a series of questions pertaining to the story's basic characteristics to insure that he read the material. During the final condition subjects were asked to copy a series of drawings taken from the Bender-Gestalt Visual Motor Test. The figures were placed just above the drawing area to limit eye movement, while arm and hand movements were restricted.

During all three conditions the investigator sat at a 90 degree angle from the subject. This enabled him to monitor the subject and paper tracing at the same time without disturbing the child. When artifact generated events occurred the investigator recorded them on the paper tracing according to a code (i.e., E=eye movement, S=swallow, etc.) The codes on the paper tracing were used in artifact rejection by cross referencing the page number of the paper tracing with the time segment (measured in epochs) of the raw EEG stored in the Stellate program.

Following this procedure 90 to 100 seconds of artifact removed EEG remained for each condition for each subject. Another qualified individual blind to condition or group performed artifact rejection on randomly chosen subjects. Agreement on rejected epochs was better than 95%.

Data from each of the three conditions were subjected to a Fast Fourier Transformation. Each FFT was computed relative to the individual calibration performed before each subject was tested. Sixteen channels of EEG were recorded across 6 band passes; Delta1=.75 to 1.75 hz., Delta2= 2.0 to 3.75 hz., Theta= 4.0 to 7.75 hz, Alpha= 8 to 12.75 hz., Beta 1= 13 to 21.75 hz., and Beta 2= 22 to 31.0 hz. The delta and beta frequency bands were subdivided to help isolate artifact generated events from true EEG rhythms. The square root of power (amplitude) was calculated for each frequency band. Tables of absolute and relative power, and topographic color maps were generated for further analyses.

Results

Psychometric

There were no significant differences for age $t=.25$, $p<.80$ or grade $t=-.91$, $p<.36$. (See table 1) Significantly lower verbal IQ was found in the ADHD group, as measured by WISC-R, $t=-2.0$, $p<.05$. No significant differences were found on performance $t=-.68$, $p<.49$ or full scale scores $t=-1.5$, $p<.12$. All subtests on the Wide Range Achievement Test revealed significantly lower ADHD scores; reading $t=-2.4$,

Table I Psychometric Differences Between Subjects with ADHD (n=25) and Controls (n=27)

	ADHD	Control
AGE		
Mean, SD	10.61 (1.0)	10.53 (1.1)
Range	9.0 - 12.11	9.1 - 12.6
GRADE		
Mean, SD	4.6 (1.1)	4.9 (1.2)
Range	3 - 7	3 - 7
WISC-R Verbal**		
Mean, SD	101.6 (11.2)	106.85 (9.3)
Range	88 - 123	92 - 125
WISC-R Performance		
Mean, SD	103.84 (10.6)	105.74 (9.3)
Range	88 - 120	90 - 121
WISC-R Full Scale		
Mean, SD	102.48 (11.4)	107.0 (9.3)
Range	88 - 124	91 - 121
WRAT-R Reading**		
Mean, SD	94.9 (9.8)	103.0 (13.9)
Range	65 - 109	85 - 138
WRAT-R Spelling**		
Mean, SD	92.6 (12.8)	99.9 (11.6)
Range	69 - 114	82 - 130
WRAT-R Arithmetic***		
Mean, SD	90.4 (12.2)	101.1 (11.8)
Range	53 - 112	88 - 133

* WRAT-R values represent standard scores
** $P<.05$ 2 tail
*** $P<.01$ 2 tail

$p<.02$, spelling $t=-2.2$, $p<.03$, and arithmetic $t=-3.2$, $p<.002$.

Neurometric

The baseline, reading, and drawing conditions each consisted of 90 to 100 seconds of artifact removed EEG. Fast Fourier transforms (FFT) were performed and numeric values plotted for each subject over 16 standard locations and six frequency bands. The data were normalized by performing log transformations on absolute and relative power values. The formula for each transformation was as follows: $\log(x)$ for absolute power, and $\log\left(\frac{x}{1-x}\right)$ for relative power (Gasser, Verleger, & Sroka, 1988). Univariate plots of the transformed data revealed normal distributions.

Multiple t-tests were used to test both between group and group by condition interactions. Individual comparisons were made by choosing a combination of frequency, power, location and condition and comparing ADHD's with controls.

The problems inherent in multiple t-tests are that one cannot control overall probability levels. To control this, principal components were used to reduce the data to one linear combination for use in discriminant analysis.

Absolute power

Between group comparisons

All significant differences were accounted for by the ADHD group producing more absolute power. (See color map) During the baseline condition the majority of differences (20 of 25) fell in frontal regions. Some of these can be attributed to eye movement, others reflect increased resting power in ADHD's. During the reading condition (10 of 14) significant differences were found in the theta band. Seven of these eleven were not found during baseline. Therefore the ADHD group had significantly increased in absolute theta power during this cognitive task. During the drawing condition a similar pattern was found. The theta band showed more differences than any other frequency (12 of 31) and in virtually identical locations as those found in the reading condition. Also many of the differences reach higher levels of significance. Notice also delta 2 and alpha bands reaching significance. All absolute differences are attributed to increased power in the ADHD group.

Group by condition interaction

The group by condition interaction represents group differences between conditions. (See Table 2) Changes from baseline to reading revealed larger absolute power decreases

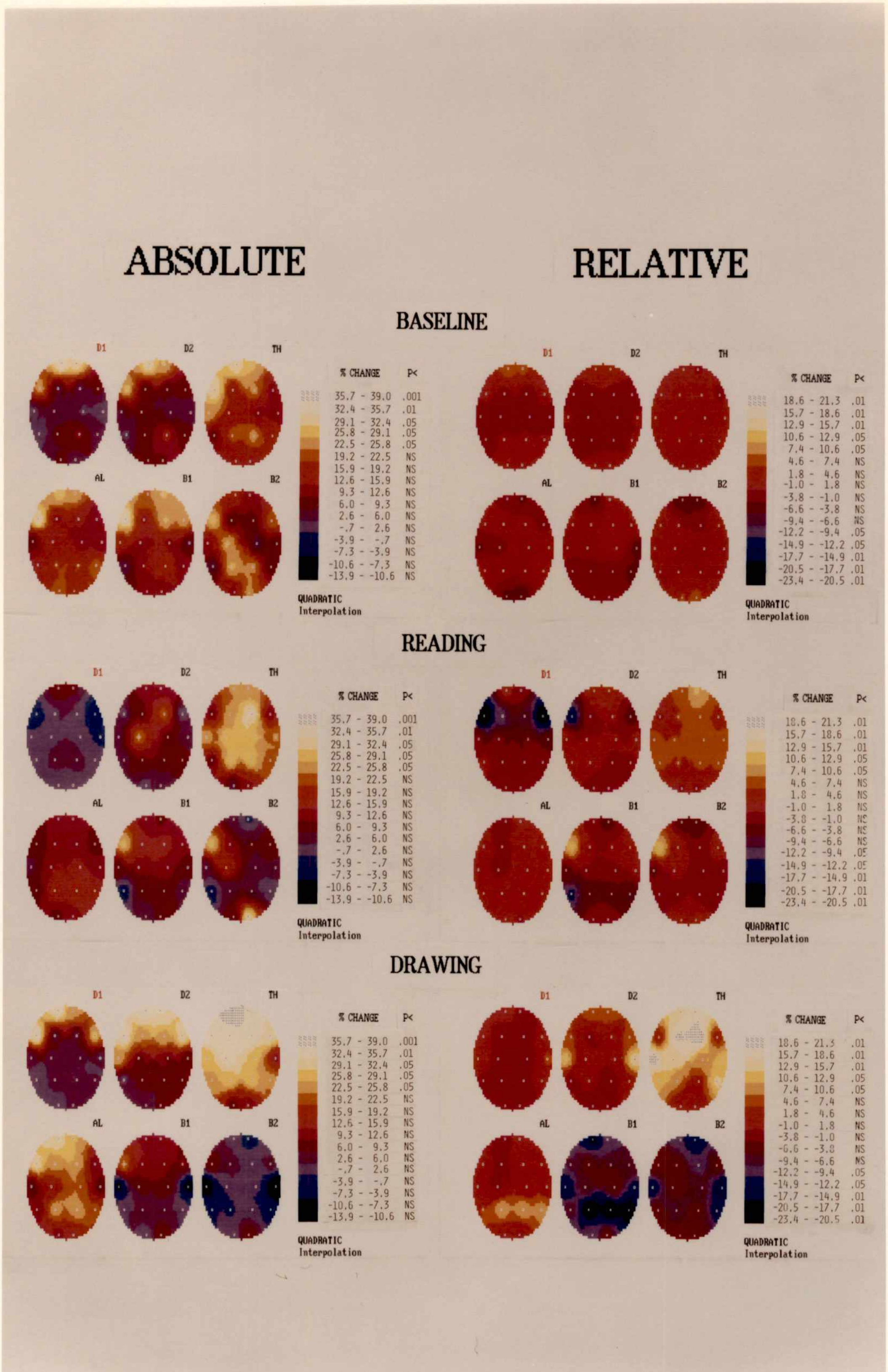
ABSOLUTE
RELATIVE
BASELINE
READING
DRAWING
D1
D2
TH
AL
B1
B2
% CHANGE
P<
35.7 - 39.0 .001
32.4 - 35.7 .01
29.1 - 32.4 .05
25.8 - 29.1 .05
22.5 - 25.8 .05
19.2 - 22.5 NS
15.9 - 19.2 NS
12.6 - 15.9 NS
9.3 - 12.6 NS
6.0 - 9.3 NS
2.6 - 6.0 NS
-.7 - 2.6 NS
-3.9 - -.7 NS
-7.3 - -3.9 NS
-10.6 - -7.3 NS
-13.9 - -10.6 NS
18.6 - 21.3 .01
15.7 - 18.6 .01
12.9 - 15.7 .01
10.6 - 12.9 .05
7.4 - 10.6 .05
4.6 - 7.4 NS
1.8 - 4.6 NS
-1.0 - 1.8 NS
-3.8 - -1.0 NS
-6.6 - -3.8 NS
-9.4 - -6.6 NS
-12.2 - -9.4 .05
-14.9 - -12.2 .05
-17.7 - -14.9 .01
-20.5 - -17.7 .01
-23.4 - -20.5 .01
QUADRATIC
Interpolation

Table 2 - ABSOLUTE DIFFERENCES

	Baseline - Reading Frequencies						Baseline - Drawing Frequencies					
	Delta1	Delta2	Theta	Alpha	Beta1	Beta2	Delta1	Delta2	Theta	Alpha	Beta1	Beta2
F_7	--	--	--	-								
F_8	--	-										
T_3	-										--	--
T_4											-	--
T_5					-				+			
T_6												-
F_{p1}	--				-							
F_{p2}	-				--						--	
F_3								+	+++			
F_4			+					+	+++			-
C_3			+						+			
C_4			+						+			
P_3												
P_4												
O_1												
O_2												

Frequencies: Delta1=.75-1.75 Hz., Delta2=2-3.75 Hz., Theta=4-7.75 Hz., Alpha=8-12.75 Hz., Beta1=13-21.75 Hz., Beta2=22-31 Hz.

ADHD>Controls	Controls>ADHD
+p<.05	-p<.05
++p<.01	--p<.01
+++p<.001	---p<.001

in frontal locations in many frequencies in the ADHD group. Most of these changes may be interpreted as increased eye movement in the controls. Other locations including F4 and C4 revealed larger increases in theta, while T5 revealed larger decreases in beta 1, in the ADHD group.

Baseline to drawing differences revealed significantly larger theta increases in the ADHD group, especially in F3 and F4, with larger beta decreases, in T3 and T4. This pattern of increased frontal theta and decreased temporal beta will be a dominant pattern as we shall see presently.

Relative power

-Between group differences

There were no significant between group differences in relative power during the baseline condition. (See color map) Both groups produced similar amounts of percent power for each frequency band relative to their total power. This lack of significance further supports the validity of differences found during the cognitive tasks. Many of the few differences in the reading condition can be attributed to eye movement except for decreased beta1 at T5. Also of interest was that four other locations in theta frequency and three locations in beta 1 frequency achieved borderline significance in hypothesized directions. During the drawing condition we once again note generalized theta increases and beta decreases in the AHDH group. Ten of sixteen theta locations and eight of sixteen beta1 locations achieved significance, with many reaching p<.01. Notice also some of the delta 2 and beta 2 bands reached significance in the same directions as theta and beta 1 respectively.

- Group by condition interaction

Changes from baseline to reading revealed significantly larger right hemisphere theta increases in the ADHD group, along with a smaller number of sites producing larger beta 1 decreases. (See Table 3) Notice F4 once again showed the largest increase in theta but also the largest decrease in beta 1 for the ADHD group.

Changes from baseline to drawing were responsible for more significant differences than any other comparison. Significantly larger generalized theta increases in ADHD's were present across eleven of sixteen locations, half of which reached p<.01 and p<.001 significance. Generalized beta1 decreases were also present in ADHD's, many of which also reached p<.01 and p<.001 significance. Both delta frequencies followed theta, and beta 2 followed beta 1 especially in temporal regions. Once again F4 revealed highly significant differences in hypothesized directions.

In a previous study (Lubar, Bainchini, Calhoun, Lambert, Brody, & Shabsin, 1985), it was shown that a visual-spatial task discriminated better than any other task

Table 3 - RELATIVE DIFFERENCES

	Baseline - Reading Frequencies						Baseline - Drawing Frequencies					
	Delta1	Delta2	Theta	Alpha	Beta1	Beta2	Delta1	Delta2	Theta	Alpha	Beta1	Beta2
F_7	-											
F_8	--		+						++			
T_3							++	++			--	--
T_4							++	++			--	---
T_5					-				+			
T_6									+			-
F_{p1}	-								++			
F_{p2}			+						++			
F_3									++			
F_4			++		--				+++		---	
C_3									+		-	-
C_4			+		-				+		--	-
P_3					-	-					--	--
P_4			+								-	--
O_1												-
O_2												

Frequencies: Delta1=.75-1.75 Hz., Delta2=2-3.75 Hz., Theta=4-7.75 Hz., Alpha=8-12.75 Hz., Beta1=13-21.75 Hz., Beta2=22-31 Hz.

ADHD>Controls	Controls>ADHD
+p<.05	-p<.05
++p<.01	--p<.01
+++p<.001	---p<.001

between children with ADD and reading disabilities and matched controls. Based upon these results we hypothesized that the drawing task would be the best predictor of group membership. We also wanted to simplify the large number of tests performed, so principal component analysis (PCA) was used to combine the many variables into principal component scores according to Gasser's criteria (Gasser, Verleger, Bacher, & Sroka, 1988). Three principal components were able to account for 82% of the variance from all of the channels.

Discriminant function analysis can be useful in performing clinical estimates of how well our model can predict whether a child meeting criteria for a given population can be classified as either ADHD or control. Discriminant analysis applied to these values showed groups were significantly different ($F = 6.48$, $p<.003$) using the first two beta 1 principal components. The other component values did not contribute to predictability. Discriminant functions showed that for a child not included in the sample statistics, the predictability rating was 74% for the controls and 80% for the ADHD's.

In summary, both analyses indicated the ADHD group produced significantly more absolute power in many frequencies, locations, and conditions. With fewer differences during baseline, the ADHD's produced significant increases in theta and decreases in beta during cognitive tasks. In relative or percent power the same pattern held.

The significantly larger theta excess is particularly evident in F3 and F4, while the beta deficiency was more prominent in T3 and T4. While the delta and beta 2 frequencies tended to follow theta and beta 1, alpha frequency was not responsible for many differences, especially in relative power comparisons. Also of interest was that very few differences were found in occipital locations for all analyses. Theta increases in ADHD's were responsible for far more significant differences than any other frequency in both absolute and relative power and during all three cognitive tasks. However, while theta increases were responsible for a larger number of significant differences, beta 1 differences were responsible for larger percentage changes between groups.

Discussion

Spectral analysis and topographic mapping has been used extensively in studies of children with dyslexia and various learning disabilities by Duffy and others (Duffy, Denckla, Bartels, & Sandini, 1980; Duffy, Denckla, Bartels, Sandini, & Kiessling, 1980; Flynn & Deering, 1989; Matousek, Rasmussen, & Gillberg, 1984). The most common findings report excesses in slow-wave activity, as well as a lack of alpha attenuation in response to signal stimuli.

In addition to EEG findings, evoked potential differences have also been reported for children with ADHD and learning disabilities. In a previous study, we reported differences between normal, learning disabled and gifted children based upon an auditory evoked potential task (Lubar, Gross, Shively, & Mann, 1990). The results replicated previous studies by showing that clinical samples displayed suppressed P300 component amplitudes compared to matched controls in response to a target auditory stimulus. In addition, they made more reponse errors to the auditory stimuli. The P300 component is believed to represent the interpretation of stimulus meaning while the P200 component represents the interpretation of stimulus detection (Ritter, Simson, & Vaughn, 1972). Therefore while ADHD and learning deficient children appear to electrophysiologically detect the presence of incomming stimuli in the same modalities as control subjects (P200), they may not be cognitively interpreting the meaning of said stimuli in the same fashion (P300). Their response amplitudes are suppressed and their latencies are delayed compared to matched controls, while behaviorally they make more response errors.

As with the EEG data, could the morphology of these waveforms, which themselves reveal suppressions and delays in stimulus interpretation, not also be indicative of a neurologically based maturational delay? The behavior and academic progress of these children is delayed as is their response latencies, while major peaks are suppressed.

However, their behavioral and academic progress tend to eventually normalize. It would be most interesting to perform longitudinal studies on children to see how evoked potential waveforms are changed during maturation.

In terms of a theoretical framework, it is apparent that children with ADHD experience difficulty in focusing their attention and concentrating for significant periods of time on academic materials. It has been known since Berger's work in the 1920s, that alerting and orientation is associated with alpha blocking in the EEG and increased desynchronization (Berger, 1929). The most consistent findings in our study, as well as others, showed increases in theta activity and a lack of beta activation during tasks which require focusing and concentration. The lack of adequate desynchronization in the EEG and the persistence of slow activity when desynchronized activity would more accurately reflect the task characteristics most likely reflects a deficit of attention and a possible neurological substrate of Attention-deficit Hyperactivity Disorder.

The control subjects were able to electro-physiologically engage during cognitive tasks by blocking the inherent slower oscillatory rhythms which dominate during cognitive inactivity. This perhaps allows them to encode more information, and better organize this information for more accurate retrieval.

The group differences were less apparent during baseline, but more so when subjects performed cognitive tasks. Baseline activity compared with differences obtained during active processing may be analgous to the exacerbation of seizures by hyperventilation during EEG, in which no abnormalities may be detected at rest, but become apparent when subjects are stressed. Ray and Cole, 1985, found an association of increased beta activity with cognitive tasks in normal subjects. We found that activated attention mechanisms generate increased beta while theta decreased.

All significant differences in absolute power were accounted for by increases in the ADHD group. By chance we would expect half of the significant differences to reflect lower ADHD power levels; this did not occur even once. We would also expect 5% significance by chance, however, the differences noted by the color maps revealed over 40% significant differences. With their significant increases in absolute power, the ADHD subjects yielded EEG frequency distributions resembling a less mature EEG profile. Also, the differences noted in the group by condition interaction in relative power indicate that relative to each group's total power, the ADHD subjects produced significant percentage increases in theta frequency and percentage decreases in beta 1 frequency relative to the control group. This again is indicative of younger children. As in absolute power, the differences were most often generalized. However, localizing increases in theta frontally and decreases in beta 1 temporally were also noted.

Of interest was that more differences were found during the drawing condition as compared with reading. These larger visual-spatial differences were also seen in our previous study where the clinical sample showed the largest increases in theta and decreases in beta during a task which required puzzle construction (Lubar et al., 1985). The two conditions in the current study were chosen in the hopes of isolating hemispheric dominance as a function of task. No such patterns emerged. Instead global differences were noted with the exception of the occipital locations (O1 and O2) where very few differences were found.

In terms of practical and clinical significance, this study not only supports and extends previous work by showing excess slow-wave frequencies in clinical samples, but also provides 80% predictability for ADHD membership and 74% for membership in the control group. Our results do not indicate pathology such as focal or generalized spiking or paroxysmal activity. All subjects had clinically read EEG's that were within normal limits.

Because the epidemiology of ADHD is estimated to affect as many as 10 to 15% of males in the school-age population (Benton & Pearl, 1978; Mykelbust & Boshes, 1969), such a prevalent condition may not be a disorder but rather a variant of maintenance of attention for didactic learning. As with most children, individuals with ADHD frequently sustain prolonged attention to television and video games and may therefore have a more motivationally influenced attention span for movement in the visual system. Perhaps these children's attention spans and learning abilities are equal to other children. They simply require more motivation, and must desire to attend to incomming stimuli whether it be reading, spelling, or video games. It would also appear that simply calling this a disorder of attention is not sufficient because under the right circumstances these children are able to attend, and for prolonged periods. The attentative difficulties situationally occur more in classroom settings, and sometimes more specifically during academic exposure to given subjects.

This study provides evidence supporting the use of topographic EEG in forming a substrate for explaining the attentive difficulties experienced by the children in the clinical sample. Similar techniques may be useful for studying maturational changes in ADHD as well as the effects of various treatments, including sleep scheduling, nutrition and medications. Neurometric analysis integrated with educational testing and psychometrics may eventually provide a more accurate and comprehensive diagnostic than previously available. However, this research data does not differentiate between related disorders such as dyslexia (Duffy, 1980), which may or may not overlap with ADHD clinically and neurophysiologically. While more research is necessary, until this kind of diagnostic differentiation is achieved, any main-stream use of this technique should be carefully regulated.

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APPENDIXES

APPENDIX A

WISC-R Scores for ADHD Subjects

Subjects		Verbal	Performance	Full Scale
1.	BB	105	100	103
2.	KT	108	109	109
3.	LB	92	93	92
4.	KM	88	95	9
5.	MC	109	118	115
6.	JR	111	106	109
7.	MC	92	91	91
8.	MC	88	106	96
9.	CT	117	100	109
10.	JR	100	114	106
11.	RC	113	118	118
12.	JG	117	112	117
13.	SK	91	91	90
14.	RT	114	117	117
15.	EC	94	111	101
16.	GC	100	88	92
17.	AS	90	95	91
18.	RW	97	96	96
19.	JC	92	92	91
20.	SK	90	115	101
21.	RS	88	90	88
22.	BL	90	96	92
23.	CG	112	108	111
24.	TB	123	120	124
25.	MT	108	115	112

WISC-R Scores for Control Subjects

Subjects		Verbal	Performance	Full Scale
1.	MH	95	113	104
2.	DH	113	121	119
3.	EF	108	95	101
4.	EM	112	109	112
5.	DO	98	93	96
6.	BR	95	101	97
7.	BO	109	100	105
8.	JR	125	106	119
9.	KM	114	100	108
10.	PA	94	109	101
11.	TF	107	105	105
12.	BM	105	118	112
13.	MB	113	115	116
14.	JL	113	109	112
15.	JH	122	111	119
16.	ST	100	95	97
17.	BY	97	96	96
18.	BH	92	96	93
19.	JD	113	111	113
20.	NW	91	93	91
21.	RD	111	102	107
22.	RD	109	118	116
23.	SB	107	109	109
24.	IB	119	117	121
25.	JH	115	120	120
26.	RS	100	90	94
27.	EB	111	101	106

WRAT-R Standard Scores for ADHD Subjects

Subjects		Reading	Spelling	Arithmetic
1.	BB	85	93	95
2.	KT	92	80	81
3.	LB	99	100	95
4.	KM	89	83	94
5.	MC	102	93	88
6.	JR	100	112	99
7.	MC	89	69	99
8.	MC	109	106	103
9.	CT	97	99	95
10.	JR	104	104	112
11.	RC	98	91	108
12.	JG	105	114	104
13.	SK	99	84	84
14.	RT	98	82	99
15.	EC	90	89	81
16.	GC	77	73	74
17.	AS	82	79	90
18.	RW	99	104	78
19.	JC	101	96	91
20.	SK	100	109	91
21.	RS	65	70	53
22.	BL	101	88	82
23.	CG	94	98	88
24.	TB	103	95	91
25.	MT	94	104	84

WRAT-R Standard Scores for Control Subjects

Subjects		Reading	Spelling	Arithmetic
1.	MH	105	102	88
2.	DH	138	108	88
3.	EF	110	130	107
4.	EM	89	87	81
5.	DO	118	107	94
6.	BR	92	98	88
7.	BO	94	89	95
8.	JR	121	114	103
9.	KM	91	93	95
10.	PA	85	87	104
11.	TF	89	86	114
12.	BM	100	109	114
13.	MB	116	106	103
14.	JL	125	116	98
15.	JH	88	87	95
16.	ST	112	104	133
17.	BY	94	89	88
18.	BH	110	94	99
19.	JD	99	95	98
20.	NW	115	111	99
21.	RD	97	82	126
22.	RD	90	92	94
23.	SB	101	104	107
24.	IB	87	87	113
25.	JH	103	113	115
26.	RS	123	100	94
27.	EB	93	98	88

	ADHD Subjects	Age	Control Subjects	Age
1.	BB	12.6	MH	11.1
2.	KT	9.7	DH	9.11
3.	LB	10.4	EF	11.11
4.	KM	9.11	EM	10.5
5.	MC	9.9	DO	10.5
6.	JR	11.7	BR	10.8
7.	MC	11.5	BO	11.8
8.	MC	10.4	JR	9.1
9.	CT	10.0	KM	10.0
10.	JR	12.1	PA	11.9
11.	RC	9.4	TF	9.1
12.	JG	9.6	BM	12.6
13.	SK	12.11	MB	10.4
14.	RT	10.6	JL	10.7
15.	EC	9.0	JH	10.1
16.	GC	9.7	ST	10.9
17.	AS	11.4	BY	12.1
18.	RW	10.5	BH	11.2
19.	JC	10.1	JD	12.6
20	SK	10.9	NW	10.9
21.	RS	9.7	RD	9.1
22.	BL	12.11	RD	9.11
23.	CG	10.3	SB	10.1
24.	TB	11.7	IB	9.2
25	MT	10.6	JH	9.6
26.			RS	9.6
27.			EB	11.1

Grade Differences

	ADHD Subjects	Grade	Control Subjects	Grade
1.	BB	7	MH	6
2.	KT	3	DH	4
3.	LM	4	EF	6
4.	KM	4	EM	4
5.	MC	4	DO	4
6.	JR	6	BR	5
7.	MC	5	BO	6
8.	MC	5	JR	4
9.	CT	4	KM	4
10.	JR	6	PA	6
11.	RC	4	TF	4
12.	JG	3	BM	7
13.	SK	6	MB	4
14.	RT	5	JL	5
15.	EC	3	JH	5
16.	GC	4	ST	5
17.	AS	5	BY	7
18.	RW	4	BH	5
19.	JC	4	JD	7
20.	SK	5	NW	5
21.	RS	3	RD	3
22.	BL	6	RD	4
23.	CG	4	SB	5
24.	TB	6	IB	3
25.	MT	5	JH	4
26.			RS	4
27.			EB	6

Connors' Parent and Teacher Behavioral Ratings

Subjects	ADHD Parent	ADHD Teacher	Subjects	Control Parent	Control Teacher
BB	18	16	MH	5	1
KT	23	19	DH	5	3
LB	18	17	EF	6	4
KM	16	15	EM	4	5
MC	25	22	DO	11	7
JR	17	17	BR	3	2
MC	16	19	BO	12	6
MC	15	16	JR	0	4
CT	15	17	KM	1	0
JR	25	17	PA	5	9
JG	21	20	TF	0	3
RC	22	16	BM	2	2
SK	18	15	MB	5	1
RT	15	15	JL	4	0
EC	19	21	JH	6	0
GC	16	15	ST	3	0
AS	23	15	BY	7	7
RW	20	16	BH	1	0
JC	22	18	JD	5	10
SK	22	19	NW	5	4
RS	19	24	RD	4	0
BL	22	16	RD	8	1

Connors' Parent and Teacher Behavioral Rating Continued

Subjects	ADHD		Subjects	Control	
	Parent	Teacher		Parent	Teacher
CG	20	20	SB	6	2
TB	21	15	IB	3	5
MT	21	20	JH	3	6
			RS	6	0
			EB	9	3

APPENDIX B

01 av 31-Jan-1990 06:47 BB2101 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	89	106	132	108	142	137	713	12.5	14.9	18.5	15.1	19.9	19.2
2	74	117	145	116	145	128	725	10.3	16.1	20.0	16.0	20.0	17.7
3	51	72	99	89	136	150	597	8.5	12.0	16.6	15.0	22.8	25.1
4	56	98	135	123	183	165	761	7.4	12.9	17.8	16.2	24.0	21.7
5	63	74	102	145	138	118	640	9.8	11.6	16.0	22.6	21.6	18.4
6	70	99	151	183	171	143	817	8.6	12.1	18.5	22.4	20.9	17.5
7	122	156	154	105	133	144	813	15.0	19.1	18.9	12.9	16.4	17.7
8	117	159	161	115	151	138	842	13.9	18.9	19.2	13.7	17.9	16.4
9	87	124	166	125	153	130	786	11.1	15.8	21.2	15.9	19.5	16.6
10	94	151	189	145	179	144	902	10.4	16.7	21.0	16.1	19.9	15.9
11	71	110	161	146	145	125	756	9.3	14.5	21.3	19.3	19.1	16.5
12	76	117	173	167	164	132	829	9.2	14.1	20.9	20.1	19.8	15.9
13	67	91	141	217	145	115	776	8.6	11.7	18.2	28.0	18.6	14.8
14	82	100	157	274	165	122	900	9.1	11.1	17.5	30.4	18.3	13.5
15	76	87	134	281	182	128	888	8.5	9.8	15.1	31.6	20.5	14.5
16	89	99	164	332	213	171	1068	8.3	9.3	15.4	31.1	19.9	16.0

01 av 31-Jan-1990 06:58 BB2201 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	86	107	128	102	139	129	691	12.5	15.4	18.5	14.8	20.1	18.7
2	87	126	150	121	148	122	754	11.5	16.7	19.9	16.0	19.6	16.2
3	52	72	97	82	125	151	579	8.9	12.4	16.8	14.2	21.6	26.2
4	61	102	132	123	162	149	730	8.4	14.0	18.1	16.9	22.2	20.4
5	54	72	105	112	125	118	586	9.2	12.3	17.9	19.1	21.4	20.2
6	73	104	164	158	175	133	808	9.1	12.9	20.3	19.6	21.7	16.4
7	87	121	142	102	140	143	734	11.8	16.5	19.3	13.8	19.0	19.5
8	95	139	159	121	149	127	790	12.0	17.6	20.1	15.3	18.9	16.1
9	80	124	159	120	151	117	750	10.7	16.6	21.1	15.9	20.1	15.6
10	106	160	194	148	188	133	929	11.5	17.2	20.9	16.0	20.2	14.3
11	78	102	158	125	150	120	733	10.6	13.9	21.6	17.1	20.4	16.4
12	87	123	181	147	172	128	838	10.4	14.6	21.6	17.5	20.5	15.3
13	72	91	143	126	144	115	692	10.5	13.1	20.7	18.3	20.8	16.6
14	88	108	174	157	169	118	813	10.8	13.2	21.4	19.3	20.8	14.5
15	70	97	123	134	186	172	781	9.0	12.4	15.7	17.1	23.8	22.0
16	82	114	146	144	208	158	852	9.6	13.4	17.1	16.9	24.4	18.6

01 av 31-Jan-1990 07:05 BB2301 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	94	114	143	117	132	103	703	13.3	16.2	20.3	16.7	18.7	14.6
2	81	112	153	121	142	98	706	11.5	15.8	21.6	17.1	20.2	13.8
3	52	74	104	96	94	77	498	10.5	14.8	21.0	19.3	18.8	15.5
4	56	93	126	112	143	111	641	8.7	14.5	19.7	17.5	22.3	17.4
5	63	80	117	94	116	90	560	11.3	14.2	20.9	16.8	20.8	16.0
6	73	92	141	126	152	94	677	10.7	13.6	20.8	18.6	22.4	13.8
7	125	150	175	129	140	108	827	15.1	18.1	21.2	15.7	16.9	13.0
8	119	141	179	132	154	126	851	13.9	16.5	21.1	15.5	18.1	14.8
9	96	132	174	134	145	93	774	12.4	17.0	22.5	17.3	18.8	12.0
10	108	153	211	150	171	109	901	12.0	17.0	23.4	16.6	18.9	12.1
11	81	114	173	129	136	89	721	11.2	15.8	24.0	17.9	18.8	12.3
12	86	117	186	141	162	95	786	10.9	14.9	23.6	17.9	20.6	12.1
13	73	98	156	116	134	84	663	11.1	14.8	23.6	17.6	20.3	12.7
14	86	106	170	135	151	86	734	11.7	14.5	23.2	18.4	20.6	11.7
15	74	96	147	118	159	113	706	10.4	13.6	20.8	16.7	22.5	16.0
16	78	100	157	132	164	101	732	10.6	13.7	21.4	18.1	22.4	13.8

02 av 28-Feb-1990 19:40 KT2102 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	128	140	196	171	181	123	939	13.6	14.9	20.9	18.2	19.2	13.1
2	128	151	214	200	218	164	1073	11.9	14.0	19.9	18.6	20.3	15.2
3	76	101	152	137	181	121	767	9.9	13.2	19.8	17.9	23.6	15.7
4	85	124	190	197	276	232	1104	7.7	11.2	17.2	17.8	25.0	21.1
5	70	104	181	135	144	84	718	9.8	14.5	25.2	18.8	20.0	11.7
6	98	143	273	250	206	119	1087	9.0	13.1	25.1	23.0	18.9	10.9
7	157	174	234	184	197	138	1084	14.5	16.0	21.6	17.0	18.1	12.7
8	148	176	248	195	211	141	1118	13.2	15.7	22.2	17.4	18.8	12.6
9	142	186	293	211	232	137	1202	11.8	15.5	24.4	17.5	19.3	11.4
10	152	208	328	242	253	157	1340	11.4	15.5	24.5	18.0	18.9	11.7
11	125	174	277	291	220	121	1207	10.3	14.5	22.9	24.1	18.2	10.0
12	115	176	285	258	231	133	1199	9.6	14.7	23.8	21.5	19.3	11.1
13	107	155	266	213	196	103	1040	10.3	14.9	25.6	20.5	18.9	9.9
14	117	162	294	256	203	108	1140	10.3	14.2	25.8	22.4	17.8	9.5
15	90	121	215	199	161	94	880	10.2	13.7	24.4	22.6	18.3	10.7
16	112	146	254	277	206	127	1123	10.0	13.0	22.7	24.7	18.4	11.3

02 av 28-Feb-1990 19:50 KT2202 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	143	156	238	166	194	139	1036	13.8	15.0	22.9	16.0	18.7	13.5
2	132	146	276	208	248	162	1171	11.3	12.4	23.5	17.8	21.2	13.8
3	79	114	182	126	178	150	829	9.5	13.8	21.9	15.2	21.4	18.1
4	88	121	271	198	251	184	1114	7.9	10.9	24.4	17.8	22.6	16.5
5	82	104	245	143	163	117	854	9.6	12.2	28.7	16.8	19.0	13.7
6	106	148	366	226	220	141	1206	8.8	12.3	30.4	18.7	18.2	11.7
7	168	180	282	201	245	197	1273	13.2	14.1	22.2	15.8	19.2	15.5
8	138	168	303	217	251	176	1253	11.0	13.4	24.2	17.3	20.1	14.1
9	141	191	352	229	261	164	1339	10.6	14.3	26.3	17.1	19.5	12.3
10	157	206	401	254	276	151	1444	10.9	14.2	27.7	17.6	19.1	10.5
11	118	165	348	257	218	121	1227	9.6	13.5	28.4	21.0	17.8	9.8
12	130	173	392	236	238	128	1298	10.0	13.4	30.2	18.2	18.4	9.9
13	108	142	349	207	202	107	1116	9.7	12.7	31.3	18.6	18.1	9.6
14	125	162	403	221	208	122	1241	10.1	13.1	32.5	17.8	16.8	9.8
15	81	108	264	155	173	112	894	9.1	12.1	29.6	17.4	19.3	12.5
16	102	143	307	193	229	171	1145	8.9	12.5	26.8	16.9	20.0	15.0

02 av 28-Feb-1990 19:58 KT2302 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	124	132	232	171	195	143	996	12.5	13.2	23.3	17.2	19.5	14.3
2	129	154	285	207	231	169	1176	11.0	13.1	24.3	17.6	19.6	14.4
3	81	101	190	147	162	134	814	9.9	12.4	23.3	18.0	19.9	16.5
4	90	127	218	182	271	212	1100	8.2	11.5	19.8	16.5	24.7	19.3
5	81	117	218	146	191	195	949	8.5	12.4	23.0	15.4	20.1	20.6
6	110	157	230	197	219	155	1066	10.3	14.7	21.6	18.5	20.5	14.5
7	163	166	290	192	239	234	1284	12.7	12.9	22.6	15.0	18.6	18.3
8	147	170	315	214	238	190	1274	11.6	13.3	24.7	16.8	18.7	14.9
9	142	181	412	241	264	213	1453	9.8	12.4	28.3	16.6	18.2	14.6
10	162	213	460	263	266	171	1534	10.6	13.9	30.0	17.1	17.3	11.1
11	123	164	347	227	207	127	1195	10.3	13.7	29.1	19.0	17.3	10.6
12	135	186	320	228	215	132	1217	11.1	15.3	26.3	18.7	17.7	10.9
13	109	151	285	206	191	123	1066	10.3	14.2	26.7	19.3	18.0	11.6
14	133	177	277	207	195	119	1107	12.0	16.0	25.0	18.7	17.6	10.7
15	90	126	204	161	174	138	894	10.1	14.1	22.8	18.0	19.5	15.5
16	109	148	227	187	209	156	1037	10.5	14.3	21.9	18.0	20.2	15.0

03						av	28-Feb-1990	21:02 LB2103		.FRQ		Amplitude	
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	138	186	213	190	199	120	1046	13.2	17.8	20.4	18.1	19.0	11.5
2	120	160	169	162	183	114	909	13.2	17.6	18.6	17.8	20.1	12.6
3	102	173	201	180	244	169	1069	9.6	16.2	18.8	16.8	22.8	15.8
4	89	129	136	129	204	153	840	10.6	15.3	16.2	15.4	24.3	18.2
5	109	158	201	229	159	103	958	11.4	16.5	21.0	23.9	16.6	10.8
6	99	137	178	209	124	88	835	11.9	16.5	21.3	25.0	14.9	10.5
7	165	209	232	197	226	227	1256	13.1	16.6	18.4	15.7	18.0	18.1
8	151	195	218	183	210	167	1124	13.5	17.3	19.4	16.3	18.7	14.8
9	142	213	244	199	208	129	1134	12.5	18.8	21.5	17.5	18.3	11.4
10	158	224	254	208	217	123	1183	13.4	18.9	21.5	17.6	18.3	10.4
11	133	183	267	240	176	109	1107	12.0	16.6	24.1	21.7	15.9	9.8
12	127	175	216	217	165	103	1003	12.7	17.5	21.5	21.6	16.4	10.3
13	130	178	244	269	161	99	1081	12.0	16.5	22.6	24.9	14.9	9.1
14	124	173	220	263	148	92	1020	12.1	17.0	21.6	25.8	14.6	9.0
15	123	178	244	388	160	102	1195	10.3	14.9	20.5	32.5	13.3	8.5
16	139	202	262	397	165	109	1274	10.9	15.8	20.6	31.2	13.0	8.5

03						av	28-Feb-1990	21:21 LB2203		.FRQ		Amplitude	
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	193	229	250	204	236	160	1273	15.2	18.0	19.6	16.1	18.5	12.6
2	123	166	199	179	215	140	1022	12.0	16.2	19.5	17.5	21.1	13.7
3	121	194	217	181	350	298	1362	8.9	14.3	15.9	13.3	25.7	21.9
4	82	141	153	157	410	410	1354	6.1	10.4	11.3	11.6	30.3	30.3
5	114	182	230	191	187	148	1052	10.9	17.3	21.8	18.1	17.8	14.1
6	114	145	191	173	158	125	905	12.6	16.0	21.1	19.1	17.5	13.8
7	192	242	274	203	288	252	1451	13.2	16.7	18.9	14.0	19.8	17.4
8	161	209	250	200	262	199	1280	12.5	16.4	19.5	15.6	20.4	15.6
9	146	232	277	211	238	154	1258	11.6	18.5	22.0	16.7	18.9	12.3
10	142	223	282	232	244	145	1269	11.2	17.6	22.2	18.3	19.3	11.4
11	126	213	300	252	198	131	1219	10.3	17.5	24.6	20.6	16.2	10.7
12	114	187	266	232	190	122	1111	10.2	16.9	23.9	20.9	17.1	11.0
13	126	208	292	235	190	127	1177	10.7	17.7	24.8	19.9	16.1	10.8
14	124	180	261	222	179	118	1084	11.5	16.6	24.0	20.5	16.5	10.9
15	119	176	232	229	217	160	1132	10.5	15.5	20.5	20.2	19.1	14.1
16	132	177	242	243	217	156	1168	11.3	15.2	20.7	20.8	18.6	13.4

03						av	28-Feb-1990	21:34 LB2303		.FRQ		Amplitude	
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	152	213	247	214	275	215	1316	11.5	16.2	18.8	16.3	20.9	16.3
2	102	158	176	176	236	187	1035	9.9	15.3	17.0	17.0	22.8	18.0
3	119	200	234	219	559	466	1797	6.6	11.1	13.0	12.2	31.1	25.9
4	83	142	130	174	609	572	1709	4.8	8.3	7.6	10.2	35.6	33.5
5	108	185	233	193	222	177	1118	9.7	16.5	20.9	17.3	19.8	15.9
6	88	132	160	156	189	156	881	10.0	15.0	18.2	17.7	21.5	17.7
7	179	232	280	220	350	342	1603	11.2	14.5	17.5	13.7	21.8	21.3
8	151	210	250	216	272	229	1329	11.4	15.8	18.8	16.3	20.4	17.3
9	134	221	284	224	296	221	1380	9.7	16.0	20.6	16.3	21.4	16.0
10	145	227	282	216	252	176	1299	11.2	17.5	21.7	16.6	19.4	13.6
11	128	211	304	233	220	166	1261	10.1	16.7	24.1	18.5	17.4	13.2
12	107	169	228	190	203	155	1052	10.2	16.1	21.7	18.1	19.3	14.7
13	119	201	266	218	203	154	1162	10.2	17.3	22.9	18.8	17.5	13.3
14	107	171	215	181	188	144	1005	10.6	17.0	21.4	18.0	18.7	14.3
15	118	199	232	216	196	150	1112	10.6	17.9	20.9	19.5	17.6	13.5
16	124	209	236	227	210	164	1170	10.6	17.9	20.2	19.4	18.0	14.0

04 av 01-Mar-1990 00:58 KM2104 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	172	195	252	162	289	378	1448	11.9	13.5	17.4	11.2	19.9	26.1
2	136	174	264	168	323	322	1388	9.8	12.5	19.1	12.1	23.3	23.2
3	99	149	208	133	194	184	967	10.3	15.4	21.5	13.8	20.0	19.0
4	117	161	230	161	234	176	1078	10.8	14.9	21.3	14.9	21.7	16.3
5	106	155	254	185	176	109	986	10.8	15.7	25.8	18.8	17.8	11.1
6	141	190	365	249	240	155	1339	10.5	14.2	27.2	18.6	17.9	11.5
7	217	249	305	190	383	323	1667	13.0	15.0	18.3	11.4	23.0	19.4
8	209	241	312	199	573	372	1906	11.0	12.6	16.4	10.4	30.1	19.5
9	212	241	330	212	327	429	1751	12.1	13.7	18.9	12.1	18.7	24.5
10	206	258	379	232	412	354	1841	11.2	14.0	20.6	12.6	22.4	19.2
11	165	236	350	232	245	203	1432	11.5	16.5	24.5	16.2	17.1	14.2
12	181	242	366	250	280	219	1538	11.7	15.7	23.8	16.3	18.2	14.2
13	173	242	352	242	221	143	1372	12.6	17.6	25.6	17.6	16.1	10.4
14	186	248	385	279	244	155	1497	12.4	16.5	25.7	18.6	16.3	10.4
15	137	183	272	253	201	119	1165	11.8	15.8	23.3	21.7	17.2	10.2
16	161	212	328	318	250	152	1422	11.3	14.9	23.1	22.4	17.6	10.7

04 av 01-Mar-1990 01:05 KM2204 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	207	213	284	158	268	275	1406	14.8	15.1	20.2	11.3	19.1	19.6
2	186	229	298	186	324	297	1521	12.2	15.1	19.6	12.3	21.3	19.6
3	130	162	221	129	222	166	1030	12.6	15.8	21.4	12.5	21.6	16.1
4	132	183	249	167	222	166	1119	11.8	16.3	22.3	15.0	19.8	14.8
5	101	161	261	162	198	148	1032	9.8	15.6	25.3	15.7	19.2	14.4
6	121	182	430	219	241	165	1359	8.9	13.4	31.7	16.1	17.7	12.2
7	211	267	398	192	326	263	1658	12.8	16.1	24.0	11.6	19.7	15.9
8	249	301	409	205	460	301	1925	12.9	15.6	21.3	10.6	23.9	15.6
9	214	248	371	197	305	318	1653	13.0	15.0	22.4	11.9	18.5	19.2
10	211	280	440	225	399	301	1855	11.4	15.1	23.7	12.1	21.5	16.2
11	170	233	360	224	241	183	1411	12.0	16.5	25.5	15.9	17.1	12.9
12	186	256	397	237	291	199	1565	11.9	16.3	25.4	15.1	18.6	12.7
13	164	236	380	213	228	151	1371	11.9	17.2	27.7	15.5	16.7	11.0
14	161	235	421	239	254	162	1473	10.9	16.0	28.6	16.2	17.3	11.0
15	116	180	298	201	240	208	1243	9.3	14.4	24.0	16.2	19.3	16.7
16	141	211	371	255	271	213	1462	9.6	14.4	25.4	17.5	18.5	14.6

04 av 01-Mar-1990 01:13 KM2304 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	156	199	268	166	274	301	1364	11.4	14.6	19.6	12.1	20.1	22.1
2	143	203	297	190	300	295	1428	10.0	14.2	20.8	13.3	21.0	20.7
3	116	159	239	140	246	215	1115	10.4	14.2	21.5	12.5	22.1	19.3
4	103	170	262	164	200	164	1063	9.7	16.0	24.6	15.4	18.8	15.4
5	97	152	256	172	211	168	1056	9.2	14.4	24.2	16.3	20.0	15.9
6	127	191	306	196	228	172	1219	10.4	15.6	25.1	16.1	18.7	14.1
7	217	288	447	210	319	254	1735	12.5	16.6	25.8	12.1	18.4	14.6
8	217	293	439	226	417	280	1873	11.6	15.7	23.5	12.1	22.3	14.9
9	178	245	389	199	296	337	1644	10.8	14.9	23.7	12.1	18.0	20.5
10	192	280	490	231	322	293	1807	10.7	15.5	27.1	12.8	17.8	16.2
11	153	221	354	206	223	190	1348	11.4	16.4	26.2	15.3	16.6	14.1
12	161	239	380	221	246	201	1446	11.1	16.5	26.2	15.3	17.0	13.9
13	151	216	337	212	211	161	1288	11.7	16.8	26.2	16.4	16.4	12.5
14	152	224	339	214	222	161	1311	11.6	17.1	25.8	16.4	16.9	12.2
15	115	168	250	203	267	238	1241	9.3	13.6	20.1	16.4	21.5	19.2
16	142	198	291	223	275	246	1376	10.3	14.4	21.2	16.2	20.0	17.9

05				av	04-Mar-1990	19:46 MC2105	.FRQ Amplitude						
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	216	295	394	404	361	472	2142	10.1	13.8	18.4	18.9	16.8	22.0
2	78	115	160	186	170	191	901	8.7	12.8	17.8	20.7	18.8	21.2
3	113	174	252	249	397	276	1462	7.7	11.9	17.3	17.1	27.2	18.9
4	75	121	183	250	257	230	1116	6.8	10.8	16.4	22.4	23.0	20.6
5	112	138	256	390	216	161	1274	8.8	10.8	20.1	30.7	16.9	12.6
6	244	367	613	977	512	347	3060	8.0	12.0	20.0	31.9	16.7	11.4
7	492	739	966	1056	986	1123	5363	9.2	13.8	18.0	19.7	18.4	20.9
8	167	234	306	332	299	314	1653	10.1	14.2	18.5	20.1	18.1	19.0
9	168	251	387	431	333	248	1818	9.2	13.8	21.3	23.7	18.3	13.7
10	162	244	375	424	358	340	1903	8.5	12.8	19.7	22.3	18.8	17.9
11	181	285	493	608	383	229	2179	8.3	13.1	22.6	27.9	17.6	10.5
12	85	145	238	342	179	121	1110	7.6	13.1	21.5	30.8	16.1	10.9
13	289	395	737	1212	560	332	3524	8.2	11.2	20.9	34.4	15.9	9.4
14	475	734	1255	2216	949	580	6208	7.6	11.8	20.2	35.7	15.3	9.3
15	447	545	942	2035	846	617	5431	8.2	10.0	17.3	37.5	15.6	11.4
16	238	358	588	1123	638	574	3519	6.8	10.2	16.7	31.9	18.1	16.3

05				av	04-Mar-1990	19:53 MC2205	.FRQ Amplitude						
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	179	205	273	234	295	367	1553	11.5	13.2	17.6	15.1	19.0	23.6
2	227	253	358	323	378	423	1963	11.6	12.9	18.2	16.5	19.3	21.6
3	99	159	253	201	469	314	1494	6.6	10.6	16.9	13.4	31.4	21.0
4	154	236	322	348	528	507	2096	7.3	11.3	15.4	16.6	25.2	24.2
5	104	155	269	263	209	180	1180	8.8	13.1	22.8	22.3	17.7	15.2
6	168	252	379	429	322	248	1799	9.4	14.0	21.1	23.9	17.9	13.8
7	227	251	365	333	382	374	1932	11.7	13.0	18.9	17.2	19.8	19.4
8	188	240	340	322	357	398	1845	10.2	13.0	18.4	17.5	19.3	21.6
9	170	274	447	441	465	371	2169	7.8	12.6	20.6	20.3	21.4	17.1
10	191	265	420	430	485	475	2265	8.4	11.7	18.5	19.0	21.4	21.0
11	145	245	408	455	322	210	1786	8.1	13.7	22.8	25.5	18.1	11.8
12	185	299	436	573	379	273	2145	8.6	13.9	20.3	26.7	17.7	12.7
13	172	250	414	506	297	184	1823	9.4	13.7	22.7	27.8	16.3	10.1
14	189	283	417	522	325	223	1959	9.6	14.4	21.3	26.7	16.6	11.4
15	163	234	416	414	305	234	1765	9.2	13.2	23.6	23.5	17.3	13.2
16	147	224	386	413	366	329	1865	7.9	12.0	20.7	22.1	19.6	17.7

05				av	04-Mar-1990	20:02 MC2305	.FRQ Amplitude						
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	193	225	291	215	263	345	1532	12.6	14.7	19.0	14.0	17.2	22.5
2	192	247	339	253	336	406	1773	10.8	13.9	19.1	14.2	19.0	22.9
3	150	212	331	213	364	276	1545	9.7	13.7	21.4	13.8	23.5	17.9
4	172	239	330	322	489	497	2050	8.4	11.7	16.1	15.7	23.9	24.3
5	139	180	259	267	373	348	1566	8.9	11.5	16.6	17.0	23.8	22.2
6	185	259	354	400	383	347	1928	9.6	13.4	18.4	20.8	19.9	18.0
7	266	293	396	295	336	340	1926	13.8	15.2	20.6	15.3	17.5	17.6
8	278	288	386	297	330	337	1916	14.5	15.0	20.1	15.5	17.3	17.6
9	216	285	487	399	411	323	2120	10.2	13.4	22.9	18.8	19.4	15.2
10	208	280	451	377	435	452	2203	9.4	12.7	20.5	17.1	19.8	20.5
11	180	257	435	392	298	221	1781	10.1	14.4	24.4	22.0	16.7	12.4
12	190	280	452	592	357	287	2157	8.8	13.0	21.0	27.4	16.5	13.3
13	180	269	426	431	304	222	1831	9.8	14.7	23.3	23.5	16.6	12.1
14	195	271	402	489	338	270	1966	9.9	13.8	20.5	24.9	17.2	13.8
15	189	257	384	408	371	344	1954	9.7	13.2	19.7	20.9	19.0	17.6
16	173	235	362	458	535	562	2326	7.5	10.1	15.6	19.7	23.0	24.2

06			av	12-Mar-1990	12:37	JR2106	.FRQ	Amplitude					
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	215	267	370	290	316	227	1686	12.8	15.9	22.0	17.2	18.8	13.5
2	209	278	429	334	378	231	1860	11.2	14.9	23.1	18.0	20.3	12.4
3	154	199	334	297	703	519	2205	7.0	9.0	15.1	13.5	31.9	23.5
4	140	215	397	332	324	234	1642	8.5	13.1	24.2	20.2	19.7	14.2
5	159	209	409	388	320	181	1666	9.5	12.6	24.5	23.3	19.2	10.8
6	183	249	498	487	372	196	1984	9.2	12.5	25.1	24.5	18.7	9.9
7	548	671	638	377	382	284	2900	18.9	23.1	22.0	13.0	13.2	9.8
8	494	611	610	374	406	262	2757	17.9	22.2	22.1	13.6	14.7	9.5
9	281	348	562	392	409	223	2214	12.7	15.7	25.4	17.7	18.5	10.1
10	262	336	579	415	481	269	2342	11.2	14.3	24.7	17.7	20.6	11.5
11	233	315	584	544	403	183	2262	10.3	13.9	25.8	24.0	17.8	8.1
12	231	305	585	535	448	191	2295	10.1	13.3	25.5	23.3	19.5	8.3
13	250	318	619	586	430	178	2381	10.5	13.3	26.0	24.6	18.1	7.5
14	234	297	627	585	426	178	2348	10.0	12.7	26.7	24.9	18.1	7.6
15	256	330	573	764	419	225	2568	10.0	12.9	22.3	29.8	16.3	8.7
16	256	331	605	718	417	219	2547	10.0	13.0	23.8	28.2	16.4	8.6

06			av	12-Mar-1990	12:48	JR2206	.FRQ	Amplitude					
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	349	338	448	303	359	297	2094	16.7	16.2	21.4	14.5	17.1	14.2
2	366	371	486	364	409	284	2279	16.0	16.3	21.3	16.0	18.0	12.5
3	159	209	329	284	745	555	2282	7.0	9.2	14.4	12.4	32.7	24.3
4	180	228	382	322	383	266	1762	10.2	13.0	21.7	18.3	21.8	15.1
5	157	215	384	318	270	148	1492	10.5	14.4	25.7	21.3	18.1	9.9
6	180	254	519	409	346	183	1892	9.5	13.5	27.4	21.6	18.3	9.7
7	330	424	584	364	393	246	2341	14.1	18.1	25.0	15.5	16.8	10.5
8	361	443	591	369	397	247	2408	15.0	18.4	24.5	15.3	16.5	10.3
9	249	332	528	357	402	229	2097	11.9	15.8	25.2	17.0	19.1	10.9
10	248	335	539	381	479	293	2274	10.9	14.7	23.7	16.8	21.1	12.9
11	225	318	554	404	392	190	2083	10.8	15.3	26.6	19.4	18.8	9.1
12	240	318	594	466	404	185	2207	10.9	14.4	26.9	21.1	18.3	8.4
13	240	319	604	477	382	168	2191	11.0	14.6	27.6	21.8	17.5	7.7
14	236	306	613	484	372	163	2175	10.9	14.1	28.2	22.3	17.1	7.5
15	236	310	544	527	342	162	2122	11.1	14.6	25.7	24.9	16.1	7.6
16	217	307	602	526	353	162	2167	10.0	14.2	27.8	24.3	16.3	7.5

06			av	12-Mar-1990	13:11	JR2306	.FRQ	Amplitude					
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	284	279	395	289	329	256	1833	15.5	15.2	21.6	15.8	17.9	14.0
2	237	292	426	334	355	255	1899	12.5	15.4	22.4	17.6	18.7	13.5
3	165	201	305	257	503	274	1705	9.7	11.8	17.9	15.1	29.5	16.1
4	161	231	349	266	310	191	1508	10.6	15.3	23.1	17.7	20.5	12.7
5	149	204	317	276	288	187	1420	10.5	14.3	22.3	19.4	20.3	13.1
6	176	235	390	390	336	205	1732	10.2	13.6	22.5	22.5	19.4	11.9
7	495	583	651	374	372	244	2719	18.2	21.4	24.0	13.7	13.7	9.0
8	431	507	631	386	410	247	2611	16.5	19.4	24.2	14.8	15.7	9.4
9	272	345	581	387	404	232	2222	12.2	15.5	26.2	17.4	18.2	10.4
10	246	348	556	413	409	255	2228	11.1	15.6	25.0	18.6	18.4	11.5
11	230	321	573	461	370	184	2139	10.8	15.0	26.8	21.6	17.3	8.6
12	228	330	556	502	383	187	2186	10.4	15.1	25.4	23.0	17.5	8.6
13	214	315	546	485	369	169	2097	10.2	15.0	26.0	23.1	17.6	8.1
14	210	294	499	477	348	168	1995	10.5	14.7	25.0	23.9	17.4	8.4
15	214	299	430	439	319	169	1870	11.5	16.0	23.0	23.5	17.0	9.0
16	208	286	427	460	341	191	1914	10.9	15.0	22.3	24.1	17.8	10.0

07 av 12-Mar-1990 14:51 MC2107 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	264	322	354	351	343	214	1847	14.3	17.4	19.1	19.0	18.5	11.6
2	324	367	424	420	399	237	2170	14.9	16.9	19.5	19.3	18.4	10.9
3	137	204	283	333	389	261	1608	8.5	12.7	17.6	20.7	24.2	16.3
4	178	246	337	457	419	283	1920	9.3	12.8	17.6	23.8	21.8	14.7
5	219	286	380	797	369	200	2251	9.7	12.7	16.9	35.4	16.4	8.9
6	243	292	373	714	368	156	2146	11.3	13.6	17.4	33.3	17.2	7.3
7	352	473	490	442	433	240	2429	14.5	19.5	20.2	18.2	17.8	9.9
8	374	490	506	457	425	244	2495	15.0	19.6	20.3	18.3	17.0	9.8
9	255	355	428	409	464	229	2140	11.9	16.6	20.0	19.1	21.7	10.7
10	259	356	443	437	463	257	2215	11.7	16.1	20.0	19.7	20.9	11.6
11	217	334	450	444	398	185	2027	10.7	16.5	22.2	21.9	19.6	9.1
12	236	331	460	526	430	186	2169	10.9	15.3	21.2	24.2	19.8	8.6
13	258	333	468	761	455	176	2451	10.5	13.6	19.1	31.0	18.6	7.2
14	262	332	447	709	451	170	2372	11.0	14.0	18.8	29.9	19.0	7.2
15	299	327	407	649	405	195	2282	13.1	14.3	17.8	28.4	17.7	8.5
16	334	394	434	712	435	194	2503	13.4	15.7	17.3	28.5	17.4	7.7

07 av 12-Mar-1990 14:58 MC2207 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	267	338	389	302	345	269	1910	14.0	17.7	20.4	15.8	18.1	14.1
2	263	334	392	326	397	264	1976	13.3	16.9	19.8	16.5	20.1	13.4
3	139	233	290	293	279	220	1455	9.6	16.0	20.0	20.1	19.2	15.1
4	169	267	344	375	299	159	1613	10.5	16.6	21.3	23.2	18.5	9.8
5	170	263	369	480	325	216	1824	9.3	14.4	20.2	26.3	17.8	11.8
6	198	311	418	569	319	176	1991	9.9	15.6	21.0	28.6	16.0	8.9
7	277	376	426	359	392	245	2075	13.3	18.1	20.5	17.3	18.9	11.8
8	253	349	411	353	399	239	2004	12.6	17.4	20.5	17.6	19.9	11.9
9	229	366	448	352	431	289	2115	10.8	17.3	21.2	16.6	20.4	13.7
10	207	353	452	350	411	242	2015	10.3	17.5	22.4	17.4	20.4	12.0
11	204	329	441	442	375	216	2008	10.2	16.4	22.0	22.0	18.7	10.8
12	205	343	455	433	411	198	2044	10.1	16.8	22.2	21.2	20.1	9.7
13	242	357	490	538	413	190	2230	10.8	16.0	22.0	24.1	18.5	8.5
14	221	336	465	503	407	183	2114	10.4	15.9	22.0	23.8	19.2	8.6
15	200	326	473	475	360	212	2045	9.8	15.9	23.1	23.2	17.6	10.4
16	225	381	611	538	386	221	2360	9.5	16.1	25.9	22.8	16.3	9.4

07 av 12-Mar-1990 15:05 MC2307 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	235	323	423	343	391	234	1949	12.0	16.6	21.7	17.6	20.0	12.0
2	224	308	426	411	430	242	2041	10.9	15.1	20.9	20.2	21.1	11.9
3	160	237	327	426	403	326	1878	8.5	12.6	17.4	22.7	21.5	17.3
4	172	268	374	503	416	303	2034	8.4	13.2	18.4	24.7	20.4	14.9
5	183	249	332	413	451	338	1965	9.3	12.7	16.9	21.0	22.9	17.2
6	214	287	357	516	402	245	2020	10.6	14.2	17.7	25.5	19.9	12.1
7	405	524	625	461	464	328	2806	14.4	18.7	22.3	16.4	16.5	11.7
8	385	515	612	456	469	277	2714	14.2	19.0	22.6	16.8	17.3	10.2
9	259	364	480	381	502	246	2233	11.6	16.3	21.5	17.1	22.5	11.0
10	239	358	461	397	460	246	2161	11.1	16.6	21.3	18.4	21.3	11.4
11	229	339	470	422	391	208	2060	11.1	16.5	22.8	20.5	19.0	10.1
12	229	355	477	478	435	214	2189	10.5	16.2	21.8	21.8	19.9	9.8
13	244	348	478	485	430	219	2204	11.1	15.8	21.7	22.0	19.5	9.9
14	235	347	454	480	429	199	2143	10.9	16.2	21.2	22.4	20.0	9.3
15	232	311	411	418	357	185	1915	12.1	16.2	21.5	21.8	18.7	9.7
16	249	348	431	469	414	220	2131	11.7	16.3	20.2	22.0	19.4	10.3

08 av 12-Mar-1990 19:55 MC2108 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	124	165	240	242	285	146	1202	10.3	13.7	19.9	20.1	23.7	12.2
2	139	179	252	261	326	159	1315	10.5	13.6	19.1	19.9	24.8	12.1
3	108	142	223	231	218	115	1037	10.5	13.7	21.5	22.3	21.0	11.1
4	100	139	197	227	281	181	1125	8.9	12.4	17.5	20.2	25.0	16.1
5	124	170	268	351	278	133	1325	9.3	12.8	20.2	26.5	21.0	10.1
6	133	168	255	319	256	124	1256	10.6	13.4	20.3	25.4	20.4	9.9
7	172	213	307	268	333	199	1494	11.5	14.3	20.6	18.0	22.3	13.3
8	168	208	294	256	330	201	1456	11.5	14.3	20.2	17.6	22.7	13.8
9	154	206	314	296	355	150	1475	10.5	13.9	21.3	20.1	24.1	10.2
10	162	210	316	297	369	157	1511	10.7	13.9	20.9	19.7	24.4	10.4
11	144	199	306	294	319	133	1394	10.3	14.2	22.0	21.1	22.9	9.5
12	160	217	332	344	358	146	1558	10.3	13.9	21.3	22.1	23.0	9.4
13	162	210	326	355	337	129	1519	10.7	13.8	21.4	23.4	22.2	8.5
14	159	201	314	403	330	129	1536	10.4	13.1	20.4	26.2	21.5	8.4
15	177	205	325	519	327	152	1705	10.4	12.0	19.1	30.4	19.2	8.9
16	193	220	350	601	361	152	1877	10.3	11.7	18.6	32.0	19.2	8.1

08 av 12-Mar-1990 19:49 MC2208 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	171	188	283	226	311	193	1371	12.5	13.7	20.6	16.5	22.7	14.1
2	217	208	287	244	353	199	1509	14.4	13.8	19.0	16.2	23.4	13.2
3	113	151	228	261	562	421	1737	6.5	8.7	13.1	15.0	32.4	24.2
4	127	141	209	205	391	289	1362	9.3	10.4	15.4	15.0	28.7	21.2
5	115	160	279	285	282	136	1258	9.1	12.8	22.1	22.7	22.5	10.8
6	138	152	257	275	278	147	1248	11.1	12.2	20.6	22.1	22.3	11.8
7	163	192	286	241	306	186	1373	11.9	14.0	20.8	17.5	22.3	13.5
8	223	211	293	251	334	190	1501	14.8	14.1	19.5	16.7	22.2	12.6
9	158	199	342	271	396	188	1554	10.2	12.8	22.0	17.4	25.5	12.1
10	170	189	318	279	383	162	1500	11.3	12.6	21.2	18.6	25.5	10.8
11	155	196	341	287	373	146	1497	10.3	13.1	22.7	19.2	24.9	9.8
12	161	187	340	313	387	150	1538	10.5	12.1	22.1	20.4	25.2	9.7
13	162	204	346	383	396	139	1630	9.9	12.5	21.2	23.5	24.3	8.6
14	157	176	316	372	363	138	1523	10.3	11.5	20.7	24.5	23.9	9.1
15	170	202	359	477	347	160	1716	9.9	11.8	20.9	27.8	20.2	9.3
16	177	216	371	437	383	237	1820	9.7	11.8	20.4	24.0	21.0	13.0

08 av 12-Mar-1990 19:41 MC2308 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	121	170	258	244	287	161	1241	9.8	13.7	20.8	19.7	23.1	12.9
2	167	200	284	270	334	229	1484	11.2	13.5	19.1	18.2	22.5	15.4
3	108	152	248	281	538	426	1753	6.1	8.7	14.2	16.0	30.7	24.3
4	100	140	206	203	253	174	1076	9.3	13.0	19.1	18.9	23.5	16.2
5	123	152	282	251	262	130	1200	10.2	12.7	23.5	20.9	21.8	10.8
6	128	178	269	241	236	123	1177	10.9	15.2	22.9	20.5	20.1	10.5
7	271	315	407	294	337	198	1822	14.9	17.3	22.3	16.1	18.5	10.9
8	310	351	404	303	362	219	1949	15.9	18.0	20.7	15.6	18.6	11.2
9	146	207	362	295	378	178	1567	9.3	13.2	23.1	18.9	24.1	11.4
10	168	222	358	312	376	196	1633	10.3	13.6	21.9	19.1	23.0	12.0
11	130	190	328	282	318	140	1388	9.4	13.7	23.6	20.3	22.9	10.1
12	158	215	337	310	307	153	1481	10.7	14.5	22.8	21.0	20.7	10.3
13	153	195	345	299	287	131	1410	10.8	13.8	24.5	21.2	20.4	9.3
14	154	198	315	281	258	128	1335	11.5	14.9	23.6	21.0	19.4	9.6
15	166	206	333	322	272	138	1438	11.6	14.3	23.1	22.4	18.9	9.6
16	193	239	357	349	306	162	1606	12.0	14.9	22.2	21.7	19.1	10.1

09				av 24-Mar-1990	00:56 CT2109	.FRQ	Amplitude					
Channel	Absolute Activity							Relative Activity				
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	158	165	266	159	183	107	1039	15.2	15.9	25.7	15.3	17.6	10.3
2	196	178	227	160	209	150	1120	17.5	15.9	20.2	14.3	18.6	13.4
3	73	110	215	132	208	181	918	7.9	12.0	23.4	14.3	22.6	19.7
4	85	111	172	129	237	204	938	9.1	11.8	18.3	13.7	25.3	21.8
5	91	139	253	167	172	97	919	9.9	15.1	27.6	18.1	18.8	10.5
6	83	124	234	158	167	106	872	9.5	14.3	26.8	18.1	19.2	12.1
7	202	232	286	183	290	316	1509	13.4	15.4	18.9	12.1	19.2	21.0
8	186	217	282	202	382	430	1699	10.9	12.8	16.6	11.9	22.5	25.3
9	118	176	372	206	203	107	1181	10.0	14.9	31.5	17.4	17.2	9.0
10	123	182	320	203	211	125	1164	10.6	15.6	27.5	17.4	18.2	10.8
11	99	154	357	182	162	92	1045	9.5	14.7	34.2	17.4	15.5	8.8
12	92	152	317	177	170	93	1001	9.2	15.2	31.6	17.7	17.0	9.3
13	111	154	333	182	175	96	1050	10.6	14.6	31.7	17.3	16.6	9.2
14	96	140	280	167	160	94	938	10.3	15.0	29.8	17.8	17.0	10.1
15	95	125	234	159	176	104	892	10.6	14.0	26.2	17.8	19.7	11.7
16	94	128	227	168	178	114	908	10.4	14.1	25.0	18.5	19.6	12.5

09				av 24-Mar-1990	01:05 CT2209	.FRQ	Amplitude					
Channel	Absolute Activity							Relative Activity				
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	147	162	266	176	193	128	1072	13.7	15.1	24.8	16.4	18.0	11.9
2	145	168	254	168	203	149	1087	13.3	15.4	23.4	15.5	18.7	13.7
3	75	110	210	150	261	197	1002	7.5	10.9	21.0	14.9	26.0	19.6
4	71	109	197	141	295	273	1086	6.6	10.0	18.1	13.0	27.2	25.1
5	81	137	344	173	178	111	1025	7.9	13.3	33.6	16.9	17.4	10.9
6	86	141	356	165	177	103	1027	8.3	13.7	34.6	16.0	17.2	10.1
7	123	152	298	175	210	190	1149	10.7	13.3	26.0	15.3	18.3	16.5
8	124	165	309	179	218	191	1186	10.4	13.9	26.1	15.1	18.4	16.1
9	120	189	430	225	210	125	1298	9.2	14.5	33.2	17.3	16.2	9.6
10	120	189	404	213	215	128	1269	9.5	14.9	31.8	16.8	16.9	10.1
11	100	157	418	192	173	104	1144	8.8	13.7	36.6	16.8	15.2	9.1
12	94	153	366	188	173	108	1081	8.7	14.1	33.9	17.3	16.0	10.0
13	105	159	427	205	198	110	1204	8.8	13.2	35.4	17.0	16.5	9.2
14	104	155	361	185	177	99	1080	9.7	14.3	33.4	17.1	16.4	9.2
15	92	137	287	176	200	123	1016	9.1	13.5	28.2	17.4	19.7	12.1
16	98	146	288	176	190	117	1016	9.7	14.4	28.4	17.3	18.7	11.5

09				av 24-Mar-1990	01:14 CT2309	.FRQ	Amplitude					
Channel	Absolute Activity							Relative Activity				
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	126	149	260	177	210	164	1086	11.6	13.7	24.0	16.3	19.3	15.1
2	128	152	228	170	213	163	1054	12.1	14.4	21.6	16.2	20.2	15.5
3	71	102	220	142	188	143	866	8.2	11.8	25.4	16.4	21.7	16.5
4	79	104	170	129	205	174	861	9.1	12.1	19.8	15.0	23.9	20.2
5	89	134	262	225	236	163	1108	8.0	12.1	23.7	20.3	21.3	14.7
6	91	137	258	211	212	162	1071	8.5	12.8	24.1	19.7	19.8	15.1
7	216	250	299	193	240	196	1393	15.5	18.0	21.4	13.8	17.2	14.0
8	208	232	303	190	219	164	1318	15.8	17.6	23.0	14.5	16.6	12.5
9	122	180	370	229	244	172	1317	9.2	13.7	28.1	17.4	18.5	13.1
10	131	175	343	225	260	191	1325	9.9	13.2	25.9	17.0	19.6	14.4
11	96	158	351	213	200	139	1157	8.3	13.6	30.3	18.4	17.3	12.0
12	102	146	296	196	199	140	1079	9.5	13.6	27.5	18.2	18.4	12.9
13	108	162	325	247	226	153	1221	8.9	13.3	26.6	20.3	18.5	12.5
14	103	143	269	212	204	143	1074	9.6	13.3	25.1	19.8	19.0	13.3
15	92	135	241	235	232	171	1106	8.4	12.2	21.8	21.3	21.0	15.5
16	92	137	237	231	238	188	1122	8.2	12.2	21.1	20.6	21.2	16.7

10			av 24-Mar-1990			05:06 JR2110			.FRQ		Amplitude		
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	87	104	144	109	138	136	718	12.1	14.5	20.0	15.2	19.2	18.9
2	78	95	144	109	141	122	690	11.3	13.8	20.9	15.8	20.4	17.7
3	55	74	104	98	264	179	774	7.1	9.6	13.5	12.6	34.1	23.1
4	59	80	125	104	181	132	680	8.7	11.8	18.3	15.2	26.6	19.4
5	63	74	116	115	128	89	584	10.7	12.6	19.9	19.7	21.9	15.2
6	64	83	131	132	155	102	668	9.6	12.5	19.6	19.7	23.2	15.3
7	150	172	186	127	148	124	908	16.6	19.0	20.5	14.0	16.3	13.7
8	149	175	191	126	153	129	921	16.1	18.9	20.7	13.7	16.6	14.0
9	96	124	205	147	169	133	874	11.0	14.2	23.4	16.8	19.4	15.2
10	91	125	209	149	175	133	882	10.4	14.1	23.7	16.9	19.9	15.1
11	73	109	196	146	155	109	788	9.3	13.8	24.9	18.5	19.7	13.8
12	82	120	204	145	170	112	832	9.8	14.5	24.5	17.4	20.4	13.4
13	93	113	197	169	165	100	836	11.2	13.5	23.6	20.2	19.7	11.9
14	87	109	171	167	160	97	792	11.1	13.8	21.6	21.1	20.3	12.3
15	102	111	149	197	182	100	840	12.2	13.2	17.7	23.5	21.7	11.9
16	93	101	141	198	199	124	855	10.8	11.8	16.5	23.1	23.2	14.5

10			av 24-Mar-1990			05:19 JR2210			.FRQ		Amplitude		
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	127	138	187	122	153	135	862	14.7	16.0	21.7	14.2	17.8	15.6
2	140	152	179	141	164	131	908	15.4	16.8	19.7	15.5	18.1	14.4
3	62	83	120	84	127	98	574	10.7	14.4	20.9	14.7	22.2	17.1
4	70	95	137	110	203	169	784	8.9	12.1	17.5	14.0	25.9	21.6
5	59	80	128	107	135	96	605	9.7	13.3	21.2	17.7	22.3	15.8
6	69	97	152	122	163	97	700	9.9	13.9	21.8	17.5	23.2	13.8
7	106	128	183	133	159	119	829	12.8	15.4	22.1	16.1	19.2	14.4
8	111	140	192	137	166	127	874	12.8	16.0	22.0	15.7	19.0	14.5
9	101	137	234	155	179	137	943	10.7	14.5	24.8	16.4	19.0	14.6
10	101	147	226	153	183	133	945	10.7	15.6	24.0	16.2	19.4	14.1
11	94	132	230	138	152	122	867	10.9	15.2	26.5	15.9	17.5	14.0
12	96	145	228	148	175	113	906	10.6	16.0	25.2	16.4	19.3	12.5
13	104	133	221	157	166	100	881	11.8	15.1	25.0	17.8	18.9	11.3
14	90	125	196	150	165	94	819	11.0	15.3	23.9	18.3	20.1	11.5
15	80	119	200	140	163	85	788	10.2	15.1	25.4	17.8	20.7	10.9
16	82	113	177	138	171	92	774	10.6	14.7	22.8	17.9	22.1	11.9

10			av 24-Mar-1990			05:33 JR2310			.FRQ		Amplitude		
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	90	109	165	132	155	132	784	11.5	13.9	21.0	16.9	19.8	16.9
2	98	124	176	127	160	130	815	12.0	15.2	21.6	15.5	19.7	15.9
3	58	80	119	98	191	140	685	8.5	11.6	17.3	14.3	27.9	20.4
4	67	95	136	119	235	187	840	8.0	11.3	16.2	14.2	27.9	22.3
5	56	79	132	111	145	110	634	8.9	12.5	20.8	17.5	22.9	17.4
6	67	94	146	125	165	116	714	9.4	13.1	20.5	17.6	23.1	16.3
7	160	185	231	162	184	126	1050	15.3	17.6	22.0	15.5	17.5	12.0
8	164	198	248	167	187	136	1099	14.9	18.0	22.6	15.2	17.0	12.3
9	99	138	265	172	172	143	989	10.0	14.0	26.8	17.4	17.4	14.5
10	101	139	260	165	187	137	989	10.2	14.0	26.3	16.7	18.9	13.9
11	88	125	255	161	149	115	892	9.8	14.0	28.6	18.0	16.7	12.9
12	93	129	255	155	166	120	918	10.2	14.1	27.8	16.9	18.0	13.1
13	94	127	232	167	161	100	881	10.7	14.4	26.4	18.9	18.2	11.4
14	89	116	200	149	153	99	806	11.0	14.4	24.8	18.5	18.9	12.3
15	94	137	194	136	157	91	810	11.7	16.9	24.0	16.8	19.4	11.2
16	89	127	171	140	174	112	813	10.9	15.6	21.1	17.2	21.4	13.8

11 av 04-Apr-1990 17:29 RC2111 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	114	149	202	150	185	122	922	12.4	16.2	21.9	16.3	20.1	13.3
2	147	185	232	170	230	173	1138	12.9	16.3	20.4	14.9	20.2	15.2
3	62	140	161	122	129	84	699	8.9	20.1	23.0	17.4	18.5	12.1
4	73	127	174	162	182	110	828	8.9	15.3	21.0	19.5	22.0	13.3
5	83	135	196	183	158	101	855	9.7	15.7	23.0	21.4	18.4	11.8
6	85	154	195	213	185	111	942	9.0	16.3	20.7	22.6	19.6	11.7
7	176	205	267	189	212	145	1192	14.7	17.1	22.4	15.8	17.8	12.1
8	191	231	322	199	236	198	1377	13.9	16.8	23.4	14.5	17.1	14.4
9	101	158	242	179	221	121	1021	9.9	15.5	23.7	17.5	21.6	11.8
10	112	178	280	195	260	163	1187	9.4	15.0	23.6	16.4	21.9	13.7
11	88	149	225	177	199	110	948	9.2	15.7	23.8	18.6	21.0	11.6
12	86	158	232	198	211	121	1005	8.5	15.7	23.1	19.7	21.0	12.0
13	101	170	251	246	217	115	1100	9.2	15.5	22.8	22.4	19.7	10.5
14	98	170	233	258	198	103	1061	9.3	16.1	22.0	24.3	18.6	9.7
15	121	181	225	309	203	111	1150	10.6	15.7	19.6	26.8	17.6	9.7
16	123	193	237	322	208	108	1191	10.3	16.2	19.9	27.1	17.4	9.1

11 av 04-Apr-1990 17:38 RC2211 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	176	198	272	178	212	152	1189	14.8	16.7	22.9	15.0	17.9	12.8
2	211	241	345	215	258	195	1465	14.4	16.4	23.6	14.7	17.6	13.3
3	65	123	174	128	142	92	724	9.0	17.1	24.0	17.7	19.6	12.8
4	96	150	192	177	194	122	931	10.4	16.1	20.6	19.0	20.8	13.1
5	82	140	218	172	158	90	860	9.5	16.3	25.4	20.0	18.4	10.5
6	95	167	229	222	191	107	1012	9.4	16.5	22.7	22.0	18.8	10.6
7	181	241	371	194	215	149	1351	13.4	17.8	27.5	14.3	15.9	11.1
8	224	282	447	233	289	259	1735	12.9	16.3	25.8	13.4	16.7	14.9
9	119	167	291	199	232	134	1141	10.4	14.6	25.5	17.4	20.3	11.8
10	131	194	330	212	245	171	1284	10.2	15.1	25.7	16.5	19.1	13.4
11	95	153	256	190	204	117	1016	9.4	15.0	25.2	18.7	20.1	11.5
12	100	168	253	216	212	119	1069	9.4	15.7	23.7	20.2	19.9	11.2
13	109	176	287	240	214	111	1137	9.6	15.5	25.2	21.1	18.8	9.8
14	104	175	268	219	195	102	1064	9.8	16.4	25.2	20.6	18.4	9.6
15	112	190	343	215	196	101	1157	9.7	16.4	29.6	18.6	16.9	8.7
16	111	197	327	234	208	106	1184	9.3	16.6	27.7	19.8	17.6	9.0

11 av 04-Apr-1990 17:48 RC2311 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	151	203	304	182	204	141	1186	12.7	17.2	25.6	15.4	17.2	11.9
2	164	200	332	201	257	204	1358	12.1	14.7	24.5	14.8	18.9	15.0
3	82	217	264	157	148	104	972	8.5	22.3	27.2	16.2	15.2	10.7
4	87	152	225	181	201	131	977	8.9	15.6	23.0	18.5	20.6	13.4
5	89	164	250	176	196	153	1027	8.7	15.9	24.3	17.1	19.1	14.9
6	95	173	240	198	236	181	1124	8.5	15.4	21.3	17.7	21.0	16.1
7	252	317	486	226	226	128	1635	15.4	19.4	29.7	13.8	13.8	7.8
8	288	352	526	255	261	184	1865	15.4	18.9	28.2	13.7	14.0	9.9
9	136	187	373	193	236	139	1264	10.8	14.8	29.5	15.3	18.7	11.0
10	144	218	373	211	252	167	1366	10.5	16.0	27.3	15.4	18.5	12.2
11	115	171	291	182	205	130	1094	10.5	15.6	26.6	16.6	18.8	11.9
12	109	184	279	200	217	143	1132	9.6	16.2	24.7	17.7	19.2	12.6
13	126	190	274	204	218	143	1155	10.9	16.5	23.7	17.6	18.9	12.4
14	109	185	258	199	209	140	1100	9.9	16.8	23.4	18.1	19.0	12.8
15	118	192	257	216	236	175	1194	9.9	16.1	21.5	18.1	19.8	14.6
16	120	203	266	221	249	187	1245	9.6	16.3	21.4	17.7	20.0	15.0

12 av 05-Apr-1990 14:28 JG2112 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	97	129	203	182	184	117	911	10.6	14.2	22.2	20.0	20.1	12.9
2	108	153	216	214	196	132	1020	10.6	15.0	21.2	21.0	19.2	13.0
3	68	94	159	159	247	183	908	7.5	10.3	17.5	17.5	27.2	20.1
4	77	117	202	217	266	279	1158	6.6	10.1	17.4	18.8	22.9	24.1
5	97	119	198	254	213	140	1021	9.5	11.6	19.4	24.9	20.9	13.7
6	87	114	219	272	198	121	1011	8.6	11.3	21.7	26.9	19.6	11.9
7	152	191	275	201	223	206	1248	12.2	15.3	22.1	16.1	17.8	16.5
8	155	208	288	214	214	174	1253	12.3	16.6	23.0	17.1	17.1	13.9
9	110	166	253	241	210	135	1114	9.9	14.9	22.7	21.6	18.8	12.1
10	110	175	274	261	219	130	1170	9.4	15.0	23.4	22.3	18.7	11.1
11	98	149	243	295	196	110	1091	9.0	13.6	22.3	27.0	17.9	10.1
12	104	151	272	355	225	125	1232	8.4	12.2	22.1	28.8	18.3	10.1
13	114	148	264	319	214	118	1177	9.6	12.6	22.4	27.1	18.2	10.1
14	100	130	245	308	204	112	1100	9.1	11.8	22.3	28.0	18.6	10.2
15	118	140	224	353	249	200	1284	9.2	10.9	17.5	27.5	19.4	15.6
16	108	134	225	355	235	163	1221	8.8	11.0	18.5	29.1	19.3	13.4

12 av 05-Apr-1990 14:37 JG2212 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	164	169	236	180	182	120	1052	15.6	16.1	22.5	17.2	17.3	11.4
2	210	201	309	230	242	188	1380	15.2	14.6	22.4	16.7	17.5	13.7
3	67	97	160	133	186	131	774	8.6	12.6	20.6	17.1	24.0	17.0
4	89	121	215	195	231	244	1096	8.2	11.0	19.6	17.8	21.1	22.3
5	80	135	284	219	206	112	1037	7.8	13.0	27.4	21.1	19.9	10.8
6	82	129	268	226	199	122	1026	8.0	12.6	26.1	22.0	19.4	11.9
7	161	204	348	214	200	140	1268	12.7	16.1	27.5	16.9	15.8	11.1
8	160	199	393	224	217	149	1341	11.9	14.8	29.3	16.7	16.2	11.1
9	104	153	281	239	190	115	1082	9.6	14.1	26.0	22.1	17.5	10.6
10	120	164	309	264	210	133	1200	10.0	13.6	25.8	22.0	17.5	11.1
11	98	138	256	307	184	107	1090	9.0	12.7	23.5	28.1	16.9	9.8
12	109	148	258	361	214	118	1207	9.0	12.2	21.4	29.9	17.7	9.8
13	111	145	285	280	219	110	1151	9.7	12.6	24.7	24.4	19.0	9.6
14	102	134	248	277	200	105	1067	9.6	12.6	23.3	26.0	18.7	9.9
15	94	150	253	244	228	126	1095	8.6	13.7	23.1	22.3	20.9	11.5
16	93	143	258	250	253	183	1180	7.9	12.1	21.9	21.2	21.4	15.5

12 av 05-Apr-1990 14:50 JG2312 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	111	135	215	211	225	179	1077	10.3	12.6	20.0	19.6	20.9	16.7
2	115	148	237	244	233	184	1162	9.9	12.8	20.4	21.0	20.1	15.8
3	66	94	163	165	197	219	904	7.3	10.4	18.0	18.3	21.8	24.2
4	71	115	202	192	125	74	779	9.2	14.8	25.9	24.6	16.0	9.4
5	78	120	213	208	226	168	1013	7.7	11.8	21.1	20.5	22.3	16.6
6	87	131	203	245	218	169	1053	8.3	12.5	19.3	23.2	20.7	16.1
7	190	197	290	231	238	186	1331	14.3	14.8	21.8	17.3	17.9	13.9
8	182	199	303	239	236	181	1340	13.6	14.9	22.6	17.8	17.6	13.5
9	118	164	270	246	217	165	1179	10.0	13.9	22.9	20.8	18.4	14.0
10	124	184	294	275	226	167	1270	9.8	14.5	23.2	21.7	17.8	13.1
11	96	149	245	256	202	152	1099	8.7	13.6	22.3	23.3	18.4	13.8
12	107	159	267	393	227	155	1308	8.2	12.1	20.4	30.1	17.4	11.9
13	106	158	265	256	232	164	1181	9.0	13.4	22.4	21.7	19.6	13.9
14	104	149	234	294	213	150	1144	9.1	13.0	20.4	25.7	18.6	13.1
15	99	165	252	241	245	176	1178	8.4	14.0	21.4	20.5	20.8	14.9
16	110	175	240	271	265	226	1288	8.6	13.6	18.7	21.1	20.6	17.5

13 av 16-Apr-1990 10:49 SK2113 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	70	87	121	105	157	96	637	11.0	13.7	19.0	16.5	24.7	15.0
2	85	108	152	133	183	111	772	11.0	13.9	19.7	17.2	23.7	14.4
3	56	70	100	94	123	87	529	10.5	13.1	18.9	17.7	23.3	16.4
4	79	112	167	157	171	92	778	10.1	14.4	21.5	20.1	22.0	11.8
5	68	82	134	150	161	106	700	9.6	11.7	19.1	21.4	23.0	15.1
6	83	105	164	210	165	101	828	10.0	12.7	19.8	25.3	19.9	12.2
7	115	141	160	122	181	115	833	13.8	16.9	19.2	14.6	21.7	13.8
8	114	136	164	129	199	146	888	12.9	15.3	18.4	14.5	22.4	16.4
9	92	129	191	157	260	101	930	9.9	13.8	20.5	16.9	28.0	10.9
10	108	142	214	172	269	135	1039	10.4	13.7	20.6	16.5	25.9	13.0
11	86	120	181	163	228	117	895	9.6	13.5	20.2	18.2	25.5	13.0
12	84	121	190	169	215	102	881	9.5	13.7	21.6	19.2	24.4	11.6
13	89	108	175	169	176	97	814	10.9	13.3	21.5	20.7	21.6	11.9
14	104	129	202	210	190	106	940	11.0	13.7	21.5	22.3	20.2	11.3
15	107	109	181	208	206	150	962	11.2	11.3	18.8	21.7	21.5	15.6
16	118	133	202	266	211	121	1052	11.3	12.7	19.2	25.3	20.0	11.5

13 av 16-Apr-1990 10:57 SK2213 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	135	136	181	122	166	91	831	16.3	16.3	21.8	14.6	19.9	11.0
2	148	164	222	154	196	94	977	15.2	16.8	22.7	15.7	20.0	9.6
3	58	76	121	90	127	81	554	10.5	13.8	21.8	16.3	22.9	14.7
4	92	129	195	158	175	72	821	11.2	15.7	23.8	19.2	21.3	8.8
5	74	87	159	135	151	77	683	10.8	12.7	23.3	19.7	22.1	11.3
6	83	114	226	178	185	92	878	9.4	13.0	25.8	20.3	21.0	10.5
7	156	231	258	139	175	101	1060	14.7	21.8	24.4	13.1	16.5	9.5
8	168	240	271	155	191	99	1123	14.9	21.4	24.1	13.8	17.0	8.8
9	88	135	220	157	232	89	921	9.5	14.7	23.9	17.0	25.2	9.7
10	117	167	255	174	242	92	1047	11.2	16.0	24.3	16.6	23.1	8.8
11	84	126	212	162	190	80	854	9.9	14.7	24.8	18.9	22.3	9.4
12	88	130	204	168	200	80	870	10.1	15.0	23.5	19.3	23.0	9.2
13	94	117	206	167	161	73	818	11.5	14.3	25.2	20.4	19.7	9.0
14	107	135	235	202	186	87	953	11.3	14.2	24.7	21.2	19.5	9.1
15	110	132	259	209	204	108	1022	10.8	12.9	25.3	20.5	20.0	10.5
16	121	151	359	301	274	136	1342	9.0	11.2	26.8	22.5	20.4	10.1

13 av 16-Apr-1990 11:07 SK2313 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	127	128	148	115	161	110	789	16.1	16.2	18.7	14.6	20.4	14.0
2	148	165	193	143	190	116	955	15.5	17.3	20.2	15.0	19.9	12.2
3	62	74	106	89	115	78	523	11.8	14.2	20.2	17.0	21.9	14.9
4	94	131	177	147	176	108	834	11.3	15.8	21.3	17.6	21.2	12.9
5	71	90	142	127	158	118	706	10.0	12.8	20.1	18.0	22.3	16.7
6	92	120	177	161	186	125	860	10.7	13.9	20.5	18.7	21.7	14.5
7	180	231	250	157	181	102	1101	16.4	21.0	22.7	14.2	16.5	9.3
8	190	245	264	160	195	108	1162	16.3	21.1	22.7	13.8	16.8	9.3
9	106	144	207	166	218	107	949	11.2	15.2	21.8	17.5	23.0	11.3
10	128	174	235	175	225	107	1044	12.3	16.7	22.5	16.7	21.5	10.2
11	94	130	190	155	170	107	847	11.1	15.3	22.5	18.3	20.1	12.6
12	93	134	189	155	177	105	853	10.9	15.7	22.1	18.2	20.7	12.3
13	90	123	176	152	152	99	792	11.3	15.6	22.3	19.2	19.2	12.5
14	107	145	200	172	176	113	913	11.7	15.9	21.9	18.9	19.3	12.4
15	100	132	202	169	180	125	907	11.0	14.5	22.3	18.7	19.9	13.7
16	119	161	253	218	233	161	1145	10.4	14.1	22.1	19.0	20.3	14.0

14				av	16-Apr-1990	14:26 RT2114		.FRQ		Amplitude			
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	68	79	114	162	133	103	659	10.3	11.9	17.2	24.6	20.3	15.7
2	75	92	139	189	144	96	736	10.2	12.5	18.9	25.7	19.5	13.1
3	47	67	113	133	126	98	586	8.0	11.5	19.3	22.7	21.6	16.8
4	63	95	146	195	149	96	743	8.5	12.8	19.6	26.2	20.0	12.9
5	74	93	173	194	144	94	771	9.6	12.0	22.4	25.2	18.6	12.2
6	74	103	175	249	161	88	851	8.7	12.1	20.6	29.3	18.9	10.4
7	145	138	150	188	162	146	930	15.6	14.9	16.1	20.3	17.4	15.7
8	163	152	159	184	195	246	1097	14.8	13.8	14.5	16.8	17.7	22.4
9	83	110	186	222	156	102	860	9.7	12.8	21.6	25.8	18.1	11.9
10	94	120	196	249	176	122	958	9.8	12.6	20.5	26.0	18.4	12.8
11	75	118	222	243	154	91	903	8.3	13.1	24.6	26.9	17.1	10.1
12	67	108	187	239	147	91	840	8.0	12.9	22.3	28.5	17.5	10.9
13	78	105	203	220	149	83	839	9.4	12.5	24.1	26.3	17.8	9.9
14	93	124	225	282	175	95	994	9.3	12.5	22.6	28.4	17.6	9.5
15	118	130	221	430	186	101	1185	9.9	10.9	18.7	36.2	15.7	8.5
16	121	137	222	397	208	109	1193	10.2	11.5	18.6	33.2	17.4	9.1

14				av	16-Apr-1990	14:34 RT2214		.FRQ		Amplitude			
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	85	97	142	94	125	96	638	13.3	15.2	22.2	14.7	19.6	15.0
2	112	126	184	122	150	98	792	14.1	15.9	23.2	15.4	18.9	12.4
3	45	74	118	72	91	63	464	9.8	16.0	25.5	15.5	19.6	13.6
4	64	108	187	120	147	99	725	8.8	14.9	25.9	16.6	20.3	13.7
5	66	97	179	108	115	77	641	10.2	15.2	27.9	16.8	17.9	12.0
6	74	115	246	141	143	86	804	9.2	14.3	30.6	17.5	17.8	10.7
7	86	120	175	111	150	126	768	11.3	15.6	22.8	14.5	19.5	16.4
8	149	166	232	136	174	160	1018	14.7	16.3	22.8	13.4	17.1	15.7
9	71	121	195	121	148	102	759	9.3	16.0	25.7	16.0	19.5	13.4
10	102	147	254	146	178	124	950	10.7	15.4	26.7	15.4	18.7	13.1
11	74	133	232	125	141	92	797	9.4	16.7	29.1	15.6	17.7	11.5
12	71	121	227	126	140	90	774	9.2	15.7	29.3	16.2	18.0	11.6
13	77	126	246	129	133	83	794	9.7	15.9	31.0	16.2	16.8	10.4
14	87	140	313	157	162	93	953	9.2	14.7	32.9	16.5	17.0	9.8
15	95	127	251	167	149	93	883	10.8	14.4	28.4	18.9	16.9	10.6
16	96	134	272	177	158	101	939	10.3	14.3	29.0	18.8	16.8	10.8

14				av	16-Apr-1990	14:43 RT2314		.FRQ		Amplitude			
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	85	93	124	90	124	95	611	13.9	15.2	20.2	14.8	20.3	15.6
2	107	106	144	110	150	101	720	14.9	14.8	20.0	15.3	20.9	14.1
3	51	71	115	79	112	86	514	9.9	13.9	22.3	15.4	21.9	16.7
4	70	96	136	111	177	124	714	9.9	13.4	19.1	15.6	24.7	17.3
5	65	88	154	107	134	108	656	10.0	13.4	23.4	16.4	20.4	16.4
6	76	102	157	122	139	88	683	11.1	15.0	23.0	17.8	20.3	12.9
7	189	197	231	155	179	134	1085	17.4	18.2	21.3	14.2	16.5	12.3
8	219	219	260	169	191	154	1211	18.1	18.1	21.5	13.9	15.8	12.7
9	96	120	186	126	159	105	793	12.1	15.2	23.4	15.9	20.0	13.3
10	117	133	196	140	191	149	926	12.6	14.3	21.2	15.1	20.6	16.1
11	85	118	202	129	143	92	769	11.0	15.4	26.3	16.7	18.6	12.0
12	78	108	168	119	137	88	697	11.1	15.5	24.1	17.1	19.6	12.6
13	77	105	175	124	130	82	693	11.2	15.2	25.2	17.9	18.8	11.8
14	94	126	196	140	151	92	798	11.8	15.8	24.5	17.5	18.9	11.5
15	103	121	192	149	153	88	805	12.8	15.0	23.9	18.4	18.9	10.9
16	110	129	201	159	164	94	858	12.9	15.1	23.5	18.5	19.1	11.0

15			av	18-Apr-1990	09:28	EC2115	.FRQ	Amplitude					
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	92	139	216	149	156	130	882	10.4	15.8	24.5	16.9	17.7	14.7
2	124	173	256	178	187	146	1065	11.7	16.2	24.0	16.8	17.6	13.7
3	91	121	172	118	251	146	898	10.1	13.4	19.2	13.1	28.0	16.2
4	99	160	263	179	219	159	1079	9.2	14.8	24.3	16.6	20.3	14.8
5	101	151	308	211	162	124	1057	9.6	14.3	29.1	20.0	15.4	11.7
6	130	197	440	315	207	144	1434	9.1	13.7	30.7	22.0	14.4	10.1
7	165	225	280	193	195	167	1225	13.5	18.4	22.8	15.8	15.9	13.6
8	205	256	302	197	207	208	1374	14.9	18.6	22.0	14.3	15.1	15.1
9	126	188	328	217	209	166	1234	10.2	15.2	26.6	17.6	16.9	13.5
10	165	211	347	227	231	163	1343	12.2	15.7	25.8	16.9	17.2	12.1
11	125	187	382	229	201	153	1277	9.8	14.7	29.9	17.9	15.7	11.9
12	146	196	375	258	212	158	1344	10.9	14.6	27.9	19.2	15.7	11.8
13	160	216	455	262	208	151	1451	11.0	14.9	31.3	18.0	14.3	10.4
14	187	236	479	319	229	158	1608	11.6	14.7	29.8	19.8	14.2	9.8
15	159	223	487	313	230	144	1557	10.2	14.3	31.3	20.1	14.8	9.3
16	166	239	566	399	253	151	1774	9.3	13.5	31.9	22.5	14.2	8.5

15			av	18-Apr-1990	09:56	EC2215	.FRQ	Amplitude					
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	142	163	214	135	149	113	916	15.5	17.8	23.3	14.7	16.2	12.4
2	198	218	279	188	192	134	1210	16.4	18.0	23.1	15.5	15.9	11.1
3	83	123	157	90	237	164	853	9.7	14.4	18.3	10.6	27.7	19.2
4	103	158	230	134	183	103	911	11.3	17.3	25.3	14.7	20.1	11.3
5	119	186	251	131	137	103	927	12.8	20.0	27.1	14.1	14.8	11.2
6	129	204	294	167	156	107	1056	12.2	19.3	27.8	15.8	14.8	10.1
7	132	183	268	161	165	127	1035	12.7	17.7	25.9	15.5	15.9	12.3
8	157	215	290	154	131	87	1034	15.2	20.8	28.0	14.9	12.6	8.4
9	118	178	293	173	183	132	1076	10.9	16.5	27.2	16.1	17.0	12.3
10	156	214	318	191	186	127	1192	13.1	17.9	26.7	16.0	15.6	10.7
11	112	186	336	186	181	125	1127	9.9	16.5	29.8	16.5	16.1	11.1
12	135	205	342	197	191	134	1205	11.2	17.0	28.4	16.3	15.8	11.2
13	157	230	408	177	180	127	1279	12.3	18.0	31.9	13.9	14.1	9.9
14	177	243	373	204	192	133	1322	13.4	18.4	28.2	15.4	14.5	10.1
15	148	236	378	203	206	121	1292	11.5	18.3	29.2	15.7	15.9	9.3
16	160	249	397	228	214	137	1385	11.6	18.0	28.7	16.4	15.5	9.9

15			av	18-Apr-1990	09:48	EC2315	.FRQ	Amplitude					
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	96	137	199	127	146	100	805	12.0	17.0	24.7	15.8	18.1	12.4
2	130	176	246	160	182	125	1019	12.8	17.3	24.1	15.7	17.8	12.2
3	78	134	172	83	112	82	661	11.8	20.3	26.0	12.5	17.0	12.4
4	95	157	218	128	128	68	794	11.9	19.8	27.5	16.1	16.1	8.6
5	106	169	244	125	145	107	895	11.8	18.8	27.2	14.0	16.2	11.9
6	125	197	267	168	163	104	1024	12.2	19.3	26.1	16.4	15.9	10.2
7	207	257	329	200	196	118	1307	15.9	19.6	25.2	15.3	15.0	9.0
8	228	290	343	194	160	82	1298	17.6	22.4	26.4	15.0	12.3	6.3
9	127	192	334	184	180	116	1133	11.2	17.0	29.5	16.2	15.9	10.2
10	154	225	366	197	197	131	1270	12.1	17.7	28.9	15.5	15.5	10.3
11	112	192	349	179	177	120	1128	9.9	17.0	30.9	15.8	15.7	10.6
12	127	211	338	204	182	128	1190	10.7	17.7	28.4	17.2	15.3	10.7
13	131	217	321	181	177	117	1144	11.5	18.9	28.1	15.8	15.5	10.3
14	161	246	342	206	190	123	1270	12.7	19.4	26.9	16.3	15.0	9.7
15	141	232	285	184	192	114	1147	12.3	20.2	24.9	16.0	16.7	9.9
16	157	243	300	211	207	128	1246	12.6	19.5	24.1	16.9	16.6	10.3

16 av 12-Feb-1990 01:16 GC2116 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	107	130	128	100	115	88	667	16.0	19.4	19.2	14.9	17.2	13.2
2	89	114	131	123	142	114	713	12.5	15.9	18.4	17.3	20.0	16.0
3	67	83	104	110	116	91	572	11.7	14.6	18.3	19.3	20.2	15.9
4	68	85	119	113	136	105	625	10.8	13.7	19.0	18.0	21.7	16.7
5	84	98	136	197	137	92	743	11.3	13.1	18.3	26.5	18.4	12.4
6	90	112	149	157	149	93	751	12.0	14.9	19.8	21.0	19.9	12.3
7	367	444	314	135	108	81	1449	25.3	30.6	21.7	9.3	7.5	5.6
8	179	233	206	145	150	118	1030	17.4	22.6	20.0	14.0	14.5	11.5
9	129	157	164	132	125	86	793	16.3	19.8	20.7	16.7	15.8	10.8
10	126	162	181	167	157	112	905	14.0	17.9	20.0	18.4	17.3	12.3
11	120	139	179	251	161	117	967	12.4	14.4	18.5	25.9	16.6	12.1
12	116	142	189	324	179	123	1073	10.8	13.2	17.6	30.2	16.7	11.4
13	127	149	196	359	175	127	1133	11.2	13.1	17.3	31.7	15.4	11.2
14	119	143	193	266	175	112	1008	11.8	14.1	19.2	26.4	17.3	11.1
15	126	160	197	216	184	101	984	12.8	16.2	20.0	22.0	18.7	10.3
16	116	154	193	186	188	94	932	12.5	16.6	20.7	20.0	20.2	10.1

16 av 12-Feb-1990 01:00 GC2216 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	97	126	124	110	162	205	825	11.8	15.3	15.1	13.3	19.7	24.8
2	82	112	138	119	146	129	727	11.3	15.4	19.0	16.4	20.1	17.8
3	67	91	114	101	200	193	767	8.7	11.9	14.9	13.2	26.1	25.2
4	75	96	125	95	146	124	661	11.3	14.5	18.8	14.4	22.1	18.7
5	80	110	147	135	143	110	724	11.0	15.2	20.3	18.6	19.7	15.2
6	91	118	154	138	150	94	744	12.3	15.8	20.6	18.5	20.2	12.6
7	220	293	240	121	120	121	1115	19.7	26.3	21.5	10.9	10.8	10.8
8	138	175	165	133	158	147	917	15.0	19.1	18.0	14.5	17.2	16.0
9	116	152	166	142	184	218	978	11.8	15.6	16.9	14.5	18.8	22.3
10	130	160	179	146	162	111	887	14.6	18.0	20.2	16.4	18.3	12.5
11	113	146	179	161	159	104	861	13.2	16.9	20.7	18.7	18.4	12.1
12	122	147	183	193	167	106	918	13.3	16.0	20.0	21.0	18.2	11.6
13	119	149	199	188	165	102	922	12.9	16.1	21.6	20.4	17.9	11.1
14	123	147	190	178	163	99	901	13.7	16.3	21.1	19.8	18.1	11.0
15	106	147	195	173	172	106	899	11.8	16.4	21.7	19.2	19.1	11.8
16	93	143	186	163	171	99	854	10.9	16.8	21.7	19.1	20.0	11.5

16 av 12-Feb-1990 01:09 GC2316 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	89	105	126	114	162	194	791	11.3	13.3	15.9	14.4	20.5	24.5
2	75	98	129	123	149	132	706	10.6	13.9	18.3	17.4	21.1	18.8
3	65	86	108	113	210	206	787	8.2	10.9	13.7	14.4	26.7	26.1
4	81	90	117	103	144	121	656	12.3	13.7	17.9	15.7	21.9	18.4
5	74	96	131	123	150	115	689	10.7	13.9	19.0	17.9	21.7	16.7
6	92	113	143	134	152	97	730	12.5	15.5	19.6	18.3	20.8	13.2
7	152	178	175	127	124	104	862	17.7	20.7	20.4	14.8	14.4	12.1
8	100	129	148	132	147	113	769	13.0	16.8	19.2	17.1	19.1	14.8
9	106	126	153	127	143	136	790	13.4	16.0	19.4	16.1	18.1	17.2
10	105	135	173	150	157	108	828	12.7	16.3	20.9	18.1	18.9	13.0
11	104	127	168	150	155	104	808	12.8	15.7	20.8	18.6	19.2	12.9
12	95	137	173	212	156	114	887	10.7	15.4	19.5	23.9	17.6	12.9
13	116	134	175	166	160	101	852	13.6	15.8	20.5	19.5	18.8	11.9
14	106	137	172	185	160	101	861	12.3	15.9	19.9	21.5	18.6	11.8
15	123	153	183	165	176	104	904	13.6	17.0	20.2	18.2	19.5	11.5
16	117	145	187	162	179	98	888	13.1	16.3	21.1	18.3	20.2	11.0

17 av 12-Feb-1990 04:09 AS2117 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	261	209	221	228	237	149	1303	20.0	16.0	16.9	17.5	18.1	11.5
2	227	216	246	238	268	165	1359	16.7	15.9	18.1	17.5	19.7	12.1
3	109	125	170	178	312	235	1129	9.7	11.1	15.0	15.8	27.6	20.8
4	123	153	206	219	292	236	1229	10.0	12.4	16.8	17.8	23.7	19.2
5	106	130	220	314	177	94	1042	10.2	12.5	21.1	30.2	17.0	9.1
6	130	162	253	333	224	113	1215	10.7	13.4	20.8	27.4	18.4	9.3
7	328	331	370	282	285	164	1760	18.7	18.8	21.0	16.0	16.2	9.3
8	327	340	370	276	310	183	1807	18.1	18.8	20.5	15.3	17.2	10.1
9	202	204	284	298	317	168	1473	13.7	13.8	19.3	20.2	21.5	11.4
10	187	221	292	305	393	181	1577	11.8	14.0	18.5	19.3	24.9	11.5
11	146	176	276	339	261	133	1332	11.0	13.2	20.7	25.5	19.6	10.0
12	138	176	256	353	281	143	1347	10.3	13.1	19.0	26.2	20.9	10.6
13	157	175	270	357	237	113	1308	12.0	13.4	20.6	27.3	18.1	8.6
14	178	206	299	389	253	122	1448	12.3	14.3	20.6	26.9	17.5	8.4
15	147	174	260	384	205	108	1277	11.5	13.6	20.3	30.1	16.0	8.4
16	171	208	291	494	227	116	1507	11.4	13.8	19.3	32.8	15.0	7.7

17 av 12-Feb-1990 04:17 AS2217 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	200	204	240	189	229	172	1236	16.2	16.5	19.5	15.3	18.6	14.0
2	240	242	269	220	254	178	1403	17.1	17.3	19.2	15.7	18.1	12.7
3	97	126	158	118	111	58	669	14.5	18.9	23.6	17.7	16.6	8.7
4	128	167	215	187	241	165	1102	11.6	15.2	19.5	16.9	21.9	14.9
5	114	144	213	183	153	84	891	12.8	16.2	23.9	20.5	17.2	9.4
6	117	163	254	206	183	115	1037	11.3	15.7	24.5	19.8	17.6	11.1
7	372	445	462	285	282	170	2016	18.5	22.1	22.9	14.1	14.0	8.5
8	361	440	468	268	267	188	1991	18.1	22.1	23.5	13.5	13.4	9.4
9	202	238	306	273	299	178	1496	13.5	15.9	20.5	18.2	20.0	11.9
10	214	249	336	296	292	167	1554	13.8	16.1	21.6	19.0	18.8	10.7
11	150	202	259	251	241	138	1243	12.1	16.3	20.8	20.2	19.4	11.1
12	137	199	261	260	236	140	1233	11.1	16.1	21.2	21.1	19.2	11.4
13	149	180	247	249	215	105	1145	13.0	15.7	21.5	21.7	18.8	9.2
14	171	208	292	279	225	116	1290	13.2	16.1	22.7	21.6	17.4	9.0
15	139	184	256	212	194	105	1090	12.7	16.9	23.5	19.5	17.8	9.7
16	151	186	245	231	194	121	1128	13.4	16.4	21.7	20.5	17.2	10.8

17 av 12-Feb-1990 04:27 AS2317 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	157	180	232	236	240	158	1204	13.1	15.0	19.3	19.6	19.9	13.1
2	141	177	254	234	276	172	1253	11.2	14.1	20.3	18.7	22.0	13.7
3	90	135	172	140	123	66	726	12.4	18.6	23.7	19.3	16.9	9.1
4	111	159	217	198	249	175	1109	10.0	14.3	19.5	17.9	22.5	15.8
5	104	147	214	201	190	122	979	10.6	15.0	21.9	20.6	19.5	12.5
6	115	153	230	220	211	138	1068	10.8	14.3	21.6	20.6	19.8	13.0
7	306	329	494	300	280	163	1873	16.3	17.6	26.4	16.0	15.0	8.7
8	282	315	475	288	290	182	1832	15.4	17.2	25.9	15.7	15.8	10.0
9	192	246	376	306	303	168	1591	12.1	15.5	23.6	19.2	19.0	10.5
10	191	237	385	313	317	150	1593	12.0	14.9	24.1	19.7	19.9	9.4
11	136	211	298	278	249	135	1308	10.4	16.1	22.8	21.3	19.1	10.3
12	129	186	273	358	259	150	1354	9.5	13.7	20.1	26.4	19.1	11.0
13	144	210	299	275	226	122	1275	11.3	16.4	23.5	21.6	17.7	9.5
14	149	205	291	291	239	128	1304	11.4	15.7	22.3	22.3	18.4	9.8
15	133	179	261	215	193	122	1103	12.0	16.3	23.7	19.5	17.5	11.1
16	137	171	229	226	209	141	1113	12.3	15.4	20.5	20.3	18.8	12.7

18 av 12-Feb-1990 08:34 RW2118 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	134	144	175	164	307	153	1076	12.4	13.4	16.3	15.2	28.5	14.2
2	156	158	182	160	316	149	1121	14.0	14.1	16.2	14.2	28.2	13.3
3	75	91	142	143	160	92	703	10.7	13.0	20.2	20.3	22.8	13.0
4	76	94	134	132	162	130	729	10.4	12.9	18.4	18.1	22.3	17.9
5	60	77	133	175	146	92	682	8.8	11.3	19.5	25.7	21.4	13.4
6	58	80	127	170	132	79	646	9.0	12.4	19.6	26.3	20.5	12.2
7	410	389	286	186	317	182	1771	23.2	21.9	16.1	10.5	17.9	10.3
8	370	364	291	199	388	166	1777	20.8	20.5	16.4	11.2	21.8	9.3
9	152	168	227	208	313	133	1200	12.6	14.0	18.9	17.3	26.1	11.1
10	156	182	242	214	343	135	1272	12.2	14.3	19.0	16.8	27.0	10.6
11	108	132	208	254	238	132	1071	10.1	12.3	19.4	23.7	22.3	12.3
12	105	136	217	291	239	136	1124	9.3	12.1	19.3	25.9	21.3	12.1
13	88	119	199	256	185	111	958	9.2	12.4	20.8	26.7	19.3	11.6
14	89	117	199	240	184	108	937	9.5	12.5	21.2	25.6	19.7	11.5
15	81	111	160	237	173	99	862	9.4	12.8	18.6	27.5	20.1	11.5
16	76	106	148	228	168	92	818	9.3	13.0	18.1	27.8	20.5	11.3

18 av 12-Feb-1990 08:21 RW2218 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	183	194	217	168	318	250	1330	13.7	14.6	16.3	12.7	23.9	18.8
2	182	189	208	162	316	163	1220	14.9	15.5	17.0	13.3	25.9	13.4
3	86	107	154	107	191	137	783	11.0	13.7	19.7	13.7	24.4	17.5
4	88	107	137	132	273	305	1043	8.5	10.3	13.2	12.7	26.2	29.2
5	61	83	146	110	135	87	623	9.8	13.4	23.4	17.7	21.7	14.0
6	59	89	136	108	139	99	629	9.4	14.1	21.6	17.2	22.0	15.7
7	201	292	313	196	311	233	1546	13.0	18.9	20.3	12.7	20.1	15.1
8	204	277	299	198	387	182	1546	13.2	17.9	19.3	12.8	25.0	11.8
9	121	167	222	185	303	166	1164	10.4	14.3	19.0	15.9	26.0	14.3
10	133	172	231	189	328	184	1236	10.8	13.9	18.7	15.3	26.5	14.9
11	98	136	220	208	268	207	1137	8.6	12.0	19.4	18.3	23.6	18.2
12	96	128	200	205	216	131	975	9.8	13.1	20.5	21.1	22.1	13.4
13	87	122	195	168	161	101	835	10.5	14.6	23.4	20.1	19.3	12.1
14	85	123	193	159	166	103	829	10.2	14.8	23.3	19.2	20.0	12.5
15	82	126	197	144	177	105	831	9.9	15.2	23.7	17.3	21.3	12.6
16	75	119	192	134	151	95	766	9.8	15.5	25.1	17.5	19.7	12.4

18 av 12-Feb-1990 08:28 RW2318 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	154	187	224	157	304	193	1220	12.6	15.3	18.4	12.9	24.9	15.9
2	156	179	217	153	291	183	1179	13.2	15.2	18.4	13.0	24.7	15.5
3	83	106	161	128	160	101	738	11.2	14.3	21.8	17.3	21.7	13.7
4	83	98	140	120	142	91	674	12.3	14.5	20.7	17.8	21.1	13.5
5	68	88	147	120	131	92	646	10.6	13.6	22.7	18.6	20.3	14.3
6	72	86	131	109	143	101	643	11.2	13.4	20.4	17.0	22.3	15.7
7	324	441	515	220	283	149	1932	16.8	22.8	26.7	11.4	14.7	7.7
8	283	383	463	207	352	175	1864	15.2	20.6	24.9	11.1	18.9	9.4
9	138	179	307	169	262	151	1206	11.5	14.8	25.4	14.1	21.7	12.5
10	144	185	283	178	312	201	1302	11.0	14.2	21.7	13.7	23.9	15.4
11	100	137	244	182	224	174	1061	9.4	12.9	23.0	17.1	21.1	16.4
12	96	131	218	190	207	144	986	9.7	13.3	22.1	19.2	21.0	14.7
13	90	116	208	148	161	111	834	10.7	13.9	25.0	17.8	19.3	13.3
14	95	118	198	148	170	109	838	11.4	14.1	23.6	17.7	20.3	13.0
15	102	125	190	133	159	103	811	12.5	15.4	23.5	16.3	19.6	12.7
16	94	114	180	125	151	101	766	12.2	14.9	23.5	16.4	19.8	13.2

19 av 02-Mar-1990 13:54 JC2119 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	105	113	143	140	156	121	778	13.5	14.5	18.3	18.0	20.1	15.6
2	94	110	131	133	161	133	762	12.3	14.4	17.2	17.5	21.1	17.4
3	82	97	129	137	267	280	993	8.3	9.8	13.0	13.8	26.9	28.2
4	75	95	118	138	289	287	1004	7.5	9.5	11.8	13.8	28.8	28.6
5	79	107	158	202	152	123	821	9.7	13.0	19.3	24.6	18.5	15.0
6	96	112	152	245	171	130	905	10.6	12.3	16.8	27.1	18.9	14.4
7	117	124	154	147	158	122	822	14.3	15.1	18.7	17.9	19.2	14.8
8	124	126	156	149	183	205	942	13.2	13.4	16.5	15.8	19.4	21.7
9	116	141	213	186	188	140	984	11.8	14.3	21.6	18.9	19.1	14.2
10	121	153	203	190	210	190	1066	11.3	14.3	19.0	17.8	19.7	17.8
11	94	130	215	194	164	118	915	10.2	14.2	23.5	21.2	17.9	12.9
12	104	133	196	203	159	124	919	11.3	14.5	21.4	22.1	17.3	13.5
13	103	135	219	245	174	108	984	10.5	13.7	22.3	24.9	17.7	10.9
14	121	135	215	280	177	105	1033	11.7	13.1	20.8	27.1	17.1	10.2
15	132	153	238	415	229	153	1321	10.0	11.6	18.0	31.5	17.4	11.6
16	130	135	202	405	228	170	1270	10.2	10.6	15.9	31.9	17.9	13.4

19 av 02-Mar-1990 14:02 JC2219 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	173	161	204	138	172	142	990	17.4	16.2	20.6	13.9	17.4	14.4
2	148	147	180	129	173	146	924	16.0	16.0	19.5	13.9	18.8	15.8
3	87	108	147	111	286	222	960	9.1	11.3	15.3	11.5	29.8	23.1
4	84	104	136	107	235	201	866	9.7	12.0	15.7	12.4	27.1	23.2
5	76	113	158	132	151	127	756	10.1	15.0	20.9	17.4	19.9	16.8
6	86	108	169	136	147	116	761	11.3	14.1	22.2	17.8	19.4	15.2
7	153	164	194	144	193	170	1018	15.0	16.1	19.0	14.2	19.0	16.7
8	164	168	192	145	193	132	994	16.5	16.9	19.3	14.6	19.5	13.2
9	134	163	233	165	192	156	1042	12.8	15.7	22.3	15.8	18.5	14.9
10	138	172	220	158	202	151	1042	13.3	16.5	21.1	15.2	19.4	14.5
11	107	148	218	159	152	112	897	12.0	16.6	24.4	17.7	16.9	12.5
12	105	140	196	161	153	102	856	12.2	16.3	22.9	18.8	17.9	11.9
13	104	147	211	164	157	102	886	11.7	16.6	23.8	18.5	17.7	11.5
14	111	140	213	159	159	95	877	12.7	16.0	24.3	18.1	18.1	10.8
15	108	144	221	180	171	121	945	11.5	15.2	23.3	19.0	18.1	12.8
16	109	128	217	170	182	153	960	11.4	13.3	22.6	17.7	19.0	15.9

19 av 02-Mar-1990 14:09 JC2319 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	142	138	172	135	173	137	896	15.8	15.4	19.2	15.0	19.3	15.3
2	130	133	161	127	160	138	849	15.3	15.6	18.9	14.9	18.9	16.3
3	86	98	134	117	181	146	762	11.3	12.8	17.5	15.4	23.8	19.2
4	81	104	129	109	205	160	786	10.2	13.2	16.4	13.9	26.0	20.3
5	72	90	142	128	172	135	739	9.7	12.2	19.3	17.3	23.3	18.2
6	87	114	153	131	161	134	781	11.1	14.6	19.7	16.7	20.6	17.2
7	214	270	255	166	186	131	1223	17.5	22.1	20.8	13.6	15.2	10.7
8	235	297	269	159	179	129	1267	18.5	23.4	21.2	12.5	14.2	10.2
9	131	174	230	176	192	149	1052	12.5	16.5	21.8	16.8	18.3	14.1
10	142	179	235	172	192	155	1074	13.2	16.7	21.9	16.0	17.8	14.4
11	109	149	215	172	162	123	929	11.7	16.0	23.2	18.5	17.4	13.2
12	99	143	202	170	162	123	900	11.0	15.9	22.5	18.9	18.0	13.7
13	102	143	207	167	165	118	902	11.3	15.8	22.9	18.6	18.3	13.0
14	106	149	202	166	166	116	906	11.8	16.5	22.3	18.4	18.3	12.8
15	110	129	178	162	174	122	874	12.6	14.7	20.4	18.5	19.9	13.9
16	96	126	172	157	180	160	890	10.8	14.2	19.3	17.6	20.2	17.9

20 av 07-Mar-1990 12:03 SK2120 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	137	135	166	213	171	119	940	14.5	14.3	17.7	22.6	18.2	12.7
2	109	115	135	171	155	117	802	13.6	14.4	16.8	21.3	19.3	14.6
3	82	97	137	158	150	92	715	11.4	13.6	19.1	22.1	20.9	12.8
4	62	83	116	147	158	111	678	9.1	12.3	17.1	21.7	23.4	16.4
5	83	100	163	235	174	90	845	9.8	11.9	19.3	27.8	20.6	10.7
6	92	101	159	276	172	87	887	10.4	11.4	17.9	31.1	19.4	9.8
7	226	230	196	244	202	163	1262	18.0	18.2	15.6	19.3	16.0	12.9
8	260	267	194	226	239	248	1435	18.1	18.6	13.6	15.8	16.7	17.3
9	130	163	228	312	244	154	1231	10.5	13.2	18.5	25.4	19.8	12.5
10	115	149	216	293	251	177	1201	9.6	12.4	18.0	24.4	20.9	14.8
11	109	143	211	385	261	124	1233	8.8	11.6	17.1	31.2	21.2	10.1
12	95	126	214	411	248	118	1210	7.8	10.4	17.6	33.9	20.5	9.7
13	113	130	208	398	230	106	1184	9.6	11.0	17.5	33.6	19.4	8.9
14	102	119	191	395	213	94	1115	9.1	10.7	17.2	35.4	19.1	8.5
15	123	143	199	409	225	101	1200	10.2	11.9	16.5	34.1	18.8	8.5
16	111	128	169	309	197	115	1028	10.8	12.5	16.4	30.0	19.2	11.2

20 av 07-Mar-1990 12:16 SK2220 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	164	169	206	187	162	124	1013	16.2	16.7	20.4	18.5	16.0	12.3
2	151	158	179	163	156	103	911	16.6	17.4	19.6	17.9	17.2	11.3
3	83	107	149	145	138	84	707	11.8	15.2	21.0	20.5	19.6	11.9
4	63	90	114	123	184	140	714	8.9	12.6	15.9	17.3	25.7	19.7
5	79	112	191	197	175	105	858	9.1	13.1	22.2	23.0	20.4	12.2
6	80	105	175	219	168	90	837	9.5	12.6	20.9	26.2	20.1	10.8
7	188	250	279	220	191	137	1266	14.8	19.7	22.0	17.4	15.1	10.8
8	220	295	313	223	209	158	1417	15.5	20.8	22.1	15.7	14.7	11.1
9	123	168	243	273	218	139	1165	10.6	14.4	20.9	23.4	18.7	11.9
10	116	165	226	256	231	158	1153	10.1	14.3	19.6	22.2	20.1	13.7
11	100	140	224	313	199	106	1082	9.2	12.9	20.7	28.9	18.4	9.8
12	99	135	205	323	200	108	1071	9.2	12.6	19.2	30.2	18.7	10.1
13	102	127	225	283	206	113	1055	9.6	12.1	21.3	26.8	19.5	10.7
14	100	125	196	287	198	94	1000	10.0	12.5	19.6	28.7	19.8	9.4
15	94	126	244	263	270	223	1220	7.7	10.3	20.0	21.5	22.1	18.3
16	88	113	207	230	207	141	986	9.0	11.5	21.0	23.3	21.0	14.3

20 av 07-Mar-1990 12:16 SK2220 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	164	169	206	187	162	124	1013	16.2	16.7	20.4	18.5	16.0	12.3
2	151	158	179	163	156	103	911	16.6	17.4	19.6	17.9	17.2	11.3
3	83	107	149	145	138	84	707	11.8	15.2	21.0	20.5	19.6	11.9
4	63	90	114	123	184	140	714	8.9	12.6	15.9	17.3	25.7	19.7
5	79	112	191	197	175	105	858	9.1	13.1	22.2	23.0	20.4	12.2
6	80	105	175	219	168	90	837	9.5	12.6	20.9	26.2	20.1	10.8
7	188	250	279	220	191	137	1266	14.8	19.7	22.0	17.4	15.1	10.8
8	220	295	313	223	209	158	1417	15.5	20.8	22.1	15.7	14.7	11.1
9	123	168	243	273	218	139	1165	10.6	14.4	20.9	23.4	18.7	11.9
10	116	165	226	256	231	158	1153	10.1	14.3	19.6	22.2	20.1	13.7
11	100	140	224	313	199	106	1082	9.2	12.9	20.7	28.9	18.4	9.8
12	99	135	205	323	200	108	1071	9.2	12.6	19.2	30.2	18.7	10.1
13	102	127	225	283	206	113	1055	9.6	12.1	21.3	26.8	19.5	10.7
14	100	125	196	287	198	94	1000	10.0	12.5	19.6	28.7	19.8	9.4
15	94	126	244	263	270	223	1220	7.7	10.3	20.0	21.5	22.1	18.3
16	88	113	207	230	207	141	986	9.0	11.5	21.0	23.3	21.0	14.3

21 av 22-Mar-1990 10:17 RS2121 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	75	88	118	132	175	157	745	10.0	11.8	15.9	17.7	23.5	21.1
2	84	94	120	150	255	202	906	9.3	10.4	13.2	16.6	28.2	22.3
3	55	75	102	102	223	222	779	7.0	9.6	13.1	13.1	28.7	28.5
4	63	85	120	148	314	270	1000	6.3	8.5	12.0	14.8	31.4	27.0
5	69	85	140	211	196	167	869	7.9	9.8	16.1	24.3	22.6	19.3
6	82	98	169	276	202	124	951	8.6	10.3	17.8	29.1	21.3	13.0
7	87	97	136	161	235	185	901	9.7	10.8	15.1	17.9	26.0	20.5
8	90	103	139	166	301	237	1036	8.7	9.9	13.4	16.0	29.1	22.9
9	114	136	205	202	240	167	1064	10.7	12.8	19.2	19.0	22.5	15.7
10	102	124	185	198	287	182	1078	9.4	11.5	17.2	18.4	26.6	16.9
11	86	118	184	247	181	109	925	9.3	12.7	19.9	26.7	19.6	11.8
12	89	117	181	279	203	112	980	9.1	11.9	18.5	28.5	20.7	11.4
13	111	129	209	350	216	110	1125	9.9	11.5	18.6	31.1	19.2	9.8
14	122	144	225	408	234	114	1248	9.8	11.5	18.0	32.7	18.7	9.2
15	99	114	166	271	201	131	981	10.0	11.6	16.9	27.7	20.4	13.3
16	99	117	163	260	196	126	960	10.3	12.2	17.0	27.0	20.4	13.1

21 av 22-Mar-1990 10:29 RS2221 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	90	94	125	121	213	215	858	10.5	10.9	14.5	14.1	24.9	25.1
2	108	119	142	130	272	240	1011	10.7	11.8	14.1	12.9	26.9	23.7
3	70	80	100	96	225	177	747	9.4	10.7	13.4	12.8	30.1	23.7
4	80	96	129	116	303	233	957	8.4	10.1	13.5	12.1	31.6	24.4
5	73	85	134	164	207	174	838	8.7	10.2	16.0	19.6	24.7	20.8
6	67	99	159	167	192	153	838	8.0	11.9	19.0	19.9	22.9	18.3
7	100	111	143	136	230	202	922	10.9	12.1	15.5	14.7	25.0	21.9
8	111	125	154	138	248	207	983	11.3	12.7	15.6	14.1	25.2	21.0
9	137	145	223	167	239	176	1087	12.6	13.3	20.5	15.4	22.0	16.2
10	128	144	187	137	217	132	944	13.6	15.2	19.8	14.5	23.0	13.9
11	101	123	191	236	208	170	1029	9.8	12.0	18.5	23.0	20.2	16.5
12	96	129	186	206	211	168	996	9.6	13.0	18.7	20.7	21.2	16.8
13	109	123	205	309	222	172	1138	9.5	10.8	18.0	27.1	19.5	15.1
14	107	135	212	278	212	144	1088	9.9	12.4	19.4	25.6	19.5	13.2
15	81	97	153	192	200	177	901	9.0	10.8	17.0	21.3	22.2	19.6
16	78	104	147	174	189	159	851	9.2	12.2	17.3	20.5	22.2	18.7

21 av 22-Mar-1990 10:37 RS2321 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	138	130	145	144	241	230	1026	13.4	12.6	14.1	14.0	23.5	22.4
2	141	142	157	167	237	208	1053	13.4	13.5	14.9	15.9	22.5	19.7
3	64	81	101	106	215	160	728	8.8	11.1	13.9	14.6	29.6	22.0
4	83	96	136	153	278	192	939	8.9	10.3	14.5	16.3	29.6	20.4
5	75	88	137	203	262	221	986	7.7	8.9	13.9	20.6	26.6	22.4
6	78	104	181	269	230	185	1048	7.4	9.9	17.3	25.7	22.0	17.7
7	201	223	223	195	286	230	1358	14.8	16.4	16.4	14.4	21.0	16.9
8	190	223	221	208	289	231	1362	13.9	16.4	16.2	15.3	21.2	17.0
9	132	162	233	210	256	204	1197	11.1	13.6	19.4	17.6	21.4	17.0
10	121	150	203	186	205	130	994	12.1	15.1	20.5	18.7	20.6	13.1
11	99	131	194	186	231	205	1046	9.5	12.5	18.5	17.8	22.1	19.6
12	102	132	202	210	239	209	1094	9.3	12.0	18.4	19.2	21.9	19.1
13	115	131	197	317	252	207	1220	9.4	10.8	16.2	26.0	20.7	17.0
14	123	147	233	340	245	184	1272	9.7	11.6	18.3	26.7	19.2	14.5
15	95	112	164	287	242	215	1116	8.5	10.1	14.7	25.7	21.7	19.3
16	88	112	170	276	243	212	1101	8.0	10.2	15.5	25.1	22.1	19.3

22 av 27-Mar-1990 12:56 BL2122 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	85	122	196	121	156	73	752	11.2	16.2	26.1	16.1	20.7	9.7
2	102	136	201	124	150	80	792	12.9	17.2	25.3	15.6	18.9	10.1
3	78	101	148	110	210	148	794	9.8	12.7	18.6	13.8	26.5	18.6
4	76	118	156	124	185	119	779	9.8	15.2	20.1	15.9	23.7	15.3
5	64	92	142	120	106	57	582	11.0	15.8	24.5	20.7	18.2	9.9
6	82	113	202	144	132	74	747	11.0	15.1	27.0	19.3	17.6	9.9
7	131	168	245	135	175	124	978	13.4	17.2	25.0	13.8	17.9	12.7
8	130	166	240	137	172	116	960	13.6	17.2	25.0	14.3	17.9	12.0
9	120	167	331	169	190	86	1063	11.3	15.7	31.1	15.9	17.8	8.1
10	130	167	312	165	189	94	1057	12.3	15.8	29.5	15.6	17.9	8.9
11	97	153	298	196	158	78	980	9.9	15.7	30.4	20.0	16.1	8.0
12	106	152	272	186	155	77	949	11.1	16.0	28.7	19.6	16.3	8.2
13	103	134	252	198	147	69	903	11.4	14.8	27.9	22.0	16.3	7.7
14	102	138	251	181	145	72	890	11.4	15.6	28.2	20.4	16.3	8.1
15	103	138	202	232	160	95	930	11.1	14.8	21.8	25.0	17.2	10.2
16	99	132	203	215	165	114	928	10.7	14.2	21.9	23.2	17.8	12.3

22 av 27-Mar-1990 13:06 BL2222 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	134	162	220	142	169	105	932	14.4	17.4	23.6	15.2	18.1	11.2
2	159	171	245	125	136	73	909	17.4	18.8	27.0	13.7	14.9	8.1
3	73	108	159	93	156	122	711	10.3	15.2	22.4	13.1	21.9	17.1
4	94	122	187	119	237	136	894	10.6	13.6	20.9	13.3	26.5	15.2
5	61	93	161	102	107	58	581	10.5	16.0	27.6	17.5	18.3	10.1
6	91	137	224	140	146	81	819	11.1	16.7	27.3	17.2	17.9	9.9
7	149	185	247	163	174	107	1024	14.5	18.1	24.1	15.9	17.0	10.4
8	136	176	251	153	174	113	1003	13.6	17.6	25.0	15.3	17.4	11.3
9	121	199	333	173	189	91	1107	10.9	18.0	30.1	15.7	17.1	8.3
10	125	194	336	170	202	100	1128	11.1	17.2	29.8	15.1	17.9	8.9
11	107	171	302	182	162	80	1004	10.7	17.0	30.0	18.2	16.2	7.9
12	110	174	299	193	172	88	1036	10.6	16.8	28.8	18.7	16.6	8.5
13	106	150	272	168	151	73	919	11.6	16.3	29.6	18.2	16.4	7.9
14	121	165	279	172	160	75	972	12.4	17.0	28.7	17.7	16.4	7.7
15	99	150	263	177	152	86	928	10.7	16.2	28.3	19.1	16.4	9.3
16	108	152	249	172	161	107	950	11.4	16.0	26.2	18.1	17.0	11.3

22 av 27-Mar-1990 13:12 BL2322 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	89	126	220	131	178	106	850	10.4	14.9	25.9	15.5	20.9	12.5
2	104	144	220	113	115	57	753	13.8	19.2	29.2	15.1	15.2	7.5
3	73	110	159	100	122	75	640	11.5	17.2	24.9	15.7	19.0	11.7
4	69	120	176	111	210	135	822	8.4	14.6	21.4	13.5	25.6	16.5
5	58	92	149	106	132	97	634	9.2	14.5	23.5	16.7	20.8	15.3
6	71	119	208	136	168	131	832	8.5	14.3	25.0	16.3	20.2	15.7
7	191	212	298	163	181	118	1163	16.4	18.3	25.6	14.0	15.5	10.2
8	176	207	296	164	173	104	1119	15.7	18.5	26.4	14.6	15.5	9.3
9	116	185	362	186	219	145	1213	9.5	15.2	29.9	15.3	18.1	12.0
10	113	176	341	178	211	117	1136	10.0	15.5	30.0	15.7	18.6	10.3
11	98	158	294	165	162	96	973	10.1	16.3	30.2	16.9	16.7	9.8
12	93	154	275	174	169	91	957	9.7	16.1	28.8	18.2	17.6	9.5
13	96	151	246	154	162	92	902	10.7	16.7	27.3	17.1	18.0	10.2
14	89	152	244	156	155	88	884	10.1	17.2	27.6	17.7	17.5	9.9
15	89	148	209	147	152	95	840	10.6	17.7	24.9	17.5	18.1	11.3
16	87	148	193	139	150	101	818	10.6	18.1	23.6	17.0	18.4	12.3

22 av 11-Apr-1990 02:38 CG2123 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	105	132	153	130	178	103	801	13.1	16.5	19.1	16.3	22.3	12.8
2	112	124	138	107	146	82	708	15.8	17.5	19.4	15.1	20.6	11.6
3	70	110	129	116	149	85	659	10.7	16.7	19.6	17.6	22.6	12.9
4	59	95	103	86	115	56	514	11.5	18.5	20.0	16.8	22.3	10.9
5	88	128	158	178	176	90	817	10.8	15.6	19.3	21.7	21.6	11.0
6	61	86	106	136	125	58	572	10.7	15.0	18.6	23.8	21.9	10.1
7	124	167	202	156	207	124	980	12.7	17.0	20.6	15.9	21.1	12.7
8	122	162	208	158	198	108	955	12.8	17.0	21.7	16.5	20.7	11.3
9	103	156	224	177	209	111	980	10.5	15.9	22.8	18.1	21.3	11.4
10	91	143	199	165	207	102	907	10.1	15.8	22.0	18.2	22.8	11.3
11	109	167	232	224	217	107	1055	10.3	15.8	22.0	21.2	20.6	10.1
12	89	152	208	176	205	96	927	9.6	16.4	22.4	19.0	22.2	10.3
13	114	162	218	249	220	101	1064	10.7	15.2	20.5	23.4	20.7	9.5
14	90	136	179	215	193	90	902	10.0	15.1	19.8	23.9	21.4	9.9
15	103	136	183	355	195	99	1071	9.6	12.7	17.1	33.1	18.2	9.3
16	102	133	164	285	185	90	960	10.6	13.8	17.1	29.7	19.3	9.4

23 av 11-Apr-1990 02:48 CG2223 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	147	166	204	148	181	113	959	15.3	17.3	21.2	15.5	18.9	11.8
2	158	156	190	136	173	101	915	17.3	17.1	20.8	14.9	18.9	11.1
3	74	114	144	111	145	81	669	11.1	17.1	21.5	16.5	21.7	12.1
4	73	107	127	98	131	66	601	12.2	17.9	21.1	16.2	21.7	11.0
5	84	127	173	142	169	84	778	10.8	16.3	22.2	18.2	21.7	10.8
6	66	95	132	123	141	62	620	10.7	15.4	21.2	19.9	22.8	10.0
7	127	156	215	154	211	123	986	12.9	15.9	21.8	15.6	21.4	12.5
8	107	133	199	154	204	113	911	11.7	14.6	21.9	16.9	22.4	12.4
9	111	169	245	188	213	111	1037	10.7	16.3	23.6	18.1	20.5	10.7
10	94	144	222	171	216	101	948	9.9	15.2	23.4	18.1	22.8	10.6
11	106	170	253	222	222	108	1081	9.8	15.7	23.4	20.5	20.5	10.0
12	96	153	227	201	224	101	1001	9.6	15.3	22.6	20.1	22.3	10.0
13	109	168	235	193	227	102	1035	10.6	16.2	22.7	18.7	22.0	9.9
14	101	145	193	205	206	88	938	10.8	15.4	20.6	21.9	22.0	9.4
15	89	132	193	166	177	88	844	10.5	15.6	22.8	19.7	21.0	10.4
16	95	135	180	191	182	87	870	11.0	15.5	20.7	22.0	20.9	10.0

23 av 11-Apr-1990 02:56 CG2323 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	128	134	174	151	178	120	885	14.5	15.1	19.7	17.0	20.1	13.6
2	194	171	170	118	170	109	934	20.8	18.4	18.2	12.7	18.2	11.7
3	77	105	126	110	148	93	658	11.7	15.9	19.2	16.7	22.5	14.1
4	81	109	117	90	124	76	598	13.6	18.3	19.5	15.1	20.8	12.7
5	82	123	152	136	167	99	760	10.8	16.2	20.0	17.9	22.0	13.1
6	70	101	125	114	136	81	628	11.2	16.1	20.0	18.1	21.7	13.0
7	203	197	241	184	218	135	1178	17.2	16.7	20.5	15.6	18.5	11.5
8	197	198	236	184	214	123	1153	17.1	17.2	20.5	16.0	18.6	10.7
9	125	167	248	192	205	120	1058	11.8	15.8	23.4	18.2	19.4	11.4
10	132	164	224	177	205	114	1016	13.0	16.2	22.0	17.4	20.1	11.2
11	115	174	243	183	197	113	1025	11.2	16.9	23.7	17.9	19.2	11.0
12	112	162	219	184	187	111	975	11.5	16.6	22.5	18.9	19.1	11.4
13	106	157	202	178	200	109	951	11.2	16.5	21.2	18.8	21.0	11.4
14	96	140	184	187	187	100	894	10.7	15.6	20.6	20.9	21.0	11.2
15	89	134	176	173	167	100	839	10.7	15.9	20.9	20.6	19.9	12.0
16	93	134	169	173	181	107	857	10.9	15.6	19.7	20.2	21.1	12.5

24 av 04-May-1990 02:08 TB2124 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	59	83	133	120	119	77	591	9.9	14.0	22.5	20.3	20.2	13.0
2	63	101	148	127	132	82	653	9.6	15.4	22.6	19.5	20.2	12.6
3	44	69	121	111	163	122	630	7.0	11.0	19.3	17.6	25.9	19.3
4	55	87	141	127	123	78	610	9.1	14.2	23.1	20.7	20.1	12.8
5	58	86	142	139	131	87	642	9.1	13.4	22.0	21.6	20.3	13.5
6	73	92	153	142	140	94	694	10.5	13.3	22.0	20.5	20.2	13.5
7	85	111	179	148	149	127	799	10.6	13.9	22.4	18.5	18.7	15.9
8	85	114	177	151	155	130	812	10.5	14.1	21.8	18.6	19.0	16.0
9	83	118	212	176	158	92	840	9.9	14.1	25.2	21.0	18.8	11.0
10	80	121	201	165	162	93	821	9.8	14.7	24.4	20.1	19.7	11.3
11	76	117	207	175	143	81	800	9.4	14.7	25.9	21.9	17.9	10.2
12	80	121	200	188	147	81	817	9.8	14.8	24.5	23.0	17.9	10.0
13	82	120	198	178	147	78	803	10.2	15.0	24.6	22.1	18.3	9.7
14	88	116	193	167	147	83	794	11.0	14.6	24.3	21.1	18.5	10.4
15	91	120	178	178	178	99	843	10.8	14.2	21.1	21.1	21.2	11.7
16	97	120	175	177	179	122	870	11.1	13.8	20.1	20.4	20.6	14.0

24 av 04-May-1990 02:19 TB2224 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	149	155	190	143	141	89	867	17.2	17.8	21.9	16.5	16.2	10.3
2	160	155	204	162	182	119	982	16.3	15.8	20.7	16.5	18.6	12.1
3	59	82	122	108	132	90	592	9.9	13.8	20.6	18.2	22.3	15.2
4	84	103	164	137	151	99	738	11.4	13.9	22.2	18.5	20.5	13.4
5	62	94	159	131	138	106	690	8.9	13.7	23.0	19.1	20.0	15.3
6	79	99	187	156	164	109	794	9.9	12.5	23.5	19.7	20.7	13.7
7	76	108	178	151	153	98	765	10.0	14.2	23.3	19.7	20.0	12.8
8	100	114	187	162	178	117	858	11.6	13.3	21.8	18.8	20.8	13.7
9	87	128	214	166	163	101	859	10.1	14.9	25.0	19.3	19.0	11.8
10	96	128	209	170	178	112	893	10.8	14.3	23.4	19.1	20.0	12.5
11	82	127	217	180	155	87	847	9.7	14.9	25.6	21.2	18.2	10.3
12	90	121	218	188	155	86	858	10.4	14.1	25.4	21.9	18.0	10.1
13	88	128	231	181	148	82	859	10.3	15.0	26.8	21.1	17.3	9.5
14	92	123	225	185	161	83	869	10.6	14.2	25.9	21.3	18.5	9.5
15	85	126	237	190	179	95	911	9.3	13.8	26.0	20.8	19.6	10.5
16	91	131	279	204	180	95	981	9.3	13.4	28.5	20.8	18.3	9.7

24 av 04-May-1990 02:29 TB2324 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	80	100	159	133	133	91	695	11.5	14.3	22.9	19.1	19.1	13.0
2	72	107	181	144	156	105	765	9.4	14.0	23.6	18.8	20.5	13.7
3	50	84	157	118	103	67	578	8.6	14.5	27.1	20.4	17.8	11.5
4	62	94	150	128	127	90	651	9.5	14.5	23.1	19.6	19.5	13.9
5	63	92	159	144	177	149	783	8.0	11.7	20.3	18.3	22.6	19.0
6	69	107	162	137	144	95	714	9.7	15.0	22.7	19.2	20.1	13.3
7	134	153	267	191	170	101	1017	13.2	15.1	26.3	18.8	16.7	10.0
8	123	146	269	188	176	106	1009	12.2	14.5	26.7	18.6	17.5	10.5
9	88	132	247	178	162	97	903	9.8	14.7	27.3	19.7	17.9	10.7
10	84	125	228	179	174	104	893	9.4	13.9	25.5	20.1	19.5	11.6
11	74	125	224	173	148	91	837	8.9	14.9	26.8	20.7	17.7	10.9
12	78	125	209	188	158	93	852	9.2	14.7	24.5	22.1	18.6	10.9
13	80	127	208	178	149	88	830	9.7	15.3	25.0	21.4	17.9	10.7
14	81	131	204	171	154	91	833	9.7	15.8	24.5	20.6	18.5	11.0
15	84	135	195	183	175	96	867	9.6	15.5	22.4	21.1	20.2	11.1
16	91	146	200	176	177	104	893	10.2	16.3	22.4	19.7	19.8	11.6

25 av 15-Apr-1990 12:52 MT2125 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	76	98	155	162	164	105	759	10.0	12.8	20.4	21.4	21.5	13.9
2	79	104	176	178	186	112	834	9.5	12.4	21.1	21.3	22.3	13.4
3	55	91	156	190	203	153	848	6.4	10.7	18.4	22.4	24.0	18.1
4	74	100	188	216	209	130	918	8.0	10.9	20.5	23.5	22.8	14.2
5	75	99	192	272	184	83	905	8.3	11.0	21.2	30.0	20.4	9.1
6	78	104	210	274	189	92	947	8.2	11.0	22.2	29.0	19.9	9.7
7	112	133	208	208	206	134	1001	11.1	13.3	20.8	20.8	20.6	13.4
8	116	136	208	215	216	150	1042	11.1	13.1	19.9	20.7	20.8	14.4
9	97	146	247	255	276	165	1186	8.2	12.3	20.9	21.5	23.2	13.9
10	94	143	250	248	285	160	1180	8.0	12.1	21.2	21.0	24.2	13.5
11	110	196	342	524	286	130	1588	6.9	12.3	21.5	33.0	18.0	8.2
12	107	196	344	508	301	123	1580	6.7	12.4	21.8	32.2	19.1	7.8
13	109	151	291	472	261	102	1387	7.8	10.9	21.0	34.1	18.8	7.3
14	105	143	284	447	261	106	1345	7.8	10.6	21.1	33.3	19.4	7.9
15	99	120	208	265	183	74	951	10.5	12.7	21.9	27.9	19.3	7.7
16	111	135	254	328	210	85	1124	9.9	12.0	22.6	29.2	18.7	7.6

25 av 15-Apr-1990 12:59 MT2225 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	117	126	191	172	175	110	891	13.1	14.1	21.4	19.3	19.7	12.4
2	125	123	205	167	181	109	910	13.7	13.5	22.5	18.4	19.9	12.0
3	60	93	175	193	189	133	842	7.2	11.0	20.7	22.9	22.4	15.8
4	69	89	178	190	182	105	814	8.5	11.0	21.8	23.4	22.4	12.9
5	75	118	249	263	192	97	994	7.6	11.9	25.1	26.5	19.3	9.7
6	71	101	212	242	167	83	876	8.1	11.6	24.2	27.7	19.0	9.5
7	106	132	232	199	212	131	1012	10.5	13.0	22.9	19.7	20.9	12.9
8	137	140	250	206	217	143	1093	12.5	12.8	22.8	18.9	19.9	13.1
9	97	141	262	245	254	153	1152	8.5	12.2	22.7	21.3	22.1	13.3
10	107	143	262	244	274	142	1172	9.2	12.2	22.4	20.8	23.4	12.1
11	115	173	315	495	263	124	1486	7.7	11.7	21.2	33.3	17.7	8.4
12	108	153	292	427	250	112	1342	8.0	11.4	21.8	31.8	18.6	8.3
13	120	155	294	449	253	104	1376	8.7	11.3	21.4	32.7	18.4	7.6
14	105	136	280	401	229	100	1251	8.4	10.8	22.4	32.0	18.3	8.0
15	78	122	280	269	216	99	1064	7.3	11.5	26.3	25.3	20.3	9.3
16	93	137	315	298	192	90	1125	8.3	12.2	28.0	26.5	17.0	8.0

25 av 15-Apr-1990 13:07 MT2325 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	101	110	182	170	170	101	835	12.1	13.2	21.8	20.4	20.4	12.2
2	84	109	171	159	159	99	782	10.8	13.9	21.9	20.4	20.3	12.7
3	75	99	200	216	174	102	867	8.6	11.4	23.1	25.0	20.1	11.8
4	64	91	158	170	142	72	697	9.2	13.0	22.7	24.4	20.4	10.3
5	74	117	207	243	190	91	921	8.0	12.7	22.5	26.3	20.7	9.8
6	70	100	166	190	148	77	751	9.3	13.3	22.1	25.3	19.7	10.3
7	153	162	254	193	212	127	1101	13.9	14.8	23.1	17.5	19.2	11.5
8	138	162	243	188	211	136	1079	12.8	15.0	22.5	17.4	19.6	12.6
9	107	145	252	232	270	140	1146	9.4	12.6	22.0	20.2	23.6	12.2
10	99	151	244	246	263	167	1171	8.5	12.9	20.9	21.1	22.4	14.3
11	100	154	263	278	221	105	1120	8.9	13.7	23.5	24.8	19.7	9.4
12	97	150	247	361	221	108	1185	8.2	12.7	20.8	30.5	18.7	9.1
13	98	157	260	283	215	96	1110	8.8	14.2	23.4	25.5	19.4	8.7
14	96	140	229	283	196	94	1038	9.3	13.5	22.0	27.2	18.9	9.1
15	82	139	202	227	195	84	930	8.9	14.9	21.7	24.5	21.0	9.1
16	96	136	199	216	177	86	911	10.6	15.0	21.8	23.7	19.4	9.4

01 av 23-Feb-1990 12:48 MH1101 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	92	111	172	154	157	94	780	11.8	14.3	22.1	19.7	20.1	12.0
2	90	110	180	163	174	102	820	11.0	13.4	22.0	19.8	21.3	12.5
3	68	89	156	161	273	135	882	7.7	10.1	17.7	18.3	30.9	15.3
4	65	86	151	169	279	190	940	6.9	9.1	16.1	18.0	29.7	20.3
5	74	107	227	239	207	83	937	7.9	11.4	24.2	25.5	22.1	8.9
6	84	110	195	256	207	78	931	9.1	11.8	21.0	27.5	22.2	8.4
7	106	123	184	162	168	129	873	12.1	14.2	21.1	18.5	19.3	14.8
8	109	124	186	164	176	133	893	12.3	13.9	20.9	18.4	19.7	14.9
9	112	144	246	219	229	124	1074	10.4	13.4	22.8	20.4	21.3	11.6
10	117	156	256	232	236	131	1127	10.4	13.8	22.7	20.5	21.0	11.6
11	92	135	267	318	229	115	1157	8.0	11.7	23.1	27.5	19.8	10.0
12	96	139	282	324	244	112	1196	8.0	11.6	23.6	27.1	20.4	9.4
13	105	142	292	340	261	99	1238	8.5	11.5	23.6	27.4	21.1	8.0
14	114	152	286	375	276	104	1307	8.7	11.7	21.9	28.7	21.1	8.0
15	115	155	272	351	265	100	1258	9.2	12.3	21.6	27.9	21.1	7.9
16	128	158	268	365	265	101	1285	9.9	12.3	20.9	28.4	20.6	7.9

01 av 23-Feb-1990 12:56 MH1201 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	164	149	245	163	179	105	1006	16.4	14.8	24.4	16.2	17.8	10.4
2	164	152	247	172	203	109	1047	15.7	14.5	23.6	16.4	19.4	10.4
3	83	95	173	157	174	97	779	10.7	12.3	22.2	20.1	22.4	12.4
4	96	110	229	192	202	112	942	10.2	11.7	24.3	20.4	21.5	11.9
5	74	103	249	190	204	90	912	8.1	11.3	27.3	20.9	22.4	9.9
6	83	113	242	206	208	90	941	8.8	12.0	25.7	21.9	22.1	9.6
7	158	193	263	166	181	112	1072	14.7	18.0	24.5	15.5	16.9	10.4
8	163	200	261	170	192	117	1103	14.8	18.2	23.7	15.4	17.4	10.6
9	122	158	283	222	241	128	1153	10.6	13.7	24.5	19.2	20.9	11.1
10	125	166	288	222	261	133	1195	10.5	13.9	24.1	18.6	21.9	11.1
11	102	137	289	328	253	115	1224	8.3	11.2	23.6	26.8	20.7	9.4
12	104	143	287	309	258	112	1213	8.6	11.8	23.7	25.5	21.2	9.2
13	111	140	276	264	248	106	1144	9.7	12.2	24.1	23.1	21.7	9.3
14	111	150	284	249	251	102	1147	9.7	13.1	24.7	21.7	21.9	8.9
15	105	162	288	234	251	133	1172	8.9	13.8	24.6	20.0	21.4	11.4
16	104	151	273	218	243	134	1123	9.3	13.5	24.3	19.4	21.6	11.9

01 av 23-Feb-1990 13:03 MH1301 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	109	113	214	179	197	101	914	11.9	12.3	23.4	19.6	21.6	11.1
2	99	117	201	176	201	113	907	10.9	12.9	22.2	19.4	22.2	12.5
3	76	94	196	193	312	245	1115	6.8	8.4	17.6	17.3	27.9	21.9
4	79	93	186	193	316	191	1058	7.4	8.8	17.6	18.3	29.9	18.1
5	77	112	189	165	181	99	823	9.4	13.6	23.0	20.1	21.9	12.1
6	77	100	168	189	193	109	836	9.2	12.0	20.1	22.6	23.1	13.0
7	180	209	262	181	200	120	1152	15.6	18.1	22.8	15.7	17.4	10.4
8	193	224	271	182	213	150	1234	15.6	18.2	22.0	14.7	17.3	12.1
9	126	158	243	210	238	129	1105	11.4	14.3	22.0	19.0	21.5	11.7
10	133	170	269	218	248	145	1184	11.2	14.4	22.7	18.4	20.9	12.3
11	104	141	231	224	211	111	1023	10.2	13.8	22.6	21.9	20.6	10.9
12	113	148	236	271	225	116	1109	10.2	13.4	21.3	24.5	20.3	10.4
13	105	151	246	223	244	111	1080	9.7	13.9	22.8	20.7	22.6	10.2
14	113	139	224	217	223	106	1022	11.1	13.6	21.9	21.3	21.8	10.4
15	106	170	233	221	257	135	1122	9.5	15.2	20.7	19.7	22.9	12.1
16	106	152	226	218	251	151	1104	9.6	13.7	20.5	19.8	22.7	13.7

02 av 23-Feb-1990 15:33 DH1102 .FRQ Amplitude													
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	78	100	129	121	140	97	665	11.7	15.1	19.4	18.2	21.0	14.6
2	81	95	119	121	137	97	650	12.4	14.5	18.3	18.7	21.0	15.0
3	64	90	114	124	161	96	649	9.8	13.8	17.6	19.2	24.8	14.8
4	70	93	115	134	196	129	737	9.5	12.6	15.6	18.2	26.6	17.4
5	68	92	141	147	161	84	694	9.8	13.3	20.3	21.2	23.3	12.1
6	77	101	153	182	179	91	783	9.8	12.9	19.5	23.3	22.9	11.6
7	104	133	159	132	165	169	862	12.1	15.4	18.5	15.2	19.2	19.6
8	106	130	156	136	166	146	839	12.6	15.5	18.6	16.2	19.7	17.4
9	99	138	183	165	165	113	862	11.4	16.0	21.2	19.1	19.1	13.1
10	101	137	178	164	169	113	863	11.7	15.8	20.6	19.1	19.6	13.1
11	82	120	181	272	182	123	961	8.5	12.5	18.9	28.3	19.0	12.8
12	88	126	170	233	176	115	908	9.7	13.8	18.8	25.7	19.4	12.7
13	92	123	181	228	194	107	924	9.9	13.3	19.6	24.6	21.0	11.5
14	100	129	189	297	212	117	1043	9.5	12.3	18.1	28.5	20.3	11.2
15	102	119	168	258	214	96	957	10.7	12.4	17.6	27.0	22.4	10.0
16	97	116	163	252	209	89	925	10.5	12.5	17.6	27.2	22.5	9.7

02 av 23-Feb-1990 15:43 DH1202 .FRQ Amplitude													
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	159	155	191	133	155	98	890	17.9	17.4	21.5	14.9	17.4	11.0
2	160	150	174	135	171	108	898	17.9	16.6	19.4	15.0	19.0	12.1
3	77	95	127	107	187	135	727	10.6	13.0	17.4	14.7	25.7	18.6
4	83	105	133	120	180	103	723	11.4	14.6	18.3	16.6	24.8	14.2
5	74	95	157	134	158	84	700	10.6	13.6	22.4	19.0	22.6	11.9
6	86	111	163	143	175	88	766	11.2	14.5	21.2	18.7	22.9	11.5
7	100	120	172	125	181	144	843	11.9	14.3	20.4	14.8	21.5	17.1
8	115	118	170	128	180	130	841	13.6	14.0	20.2	15.2	21.4	15.5
9	101	125	197	153	179	106	860	11.7	14.5	22.9	17.8	20.8	12.3
10	116	134	196	160	186	112	905	12.8	14.8	21.7	17.7	20.6	12.4
11	84	112	195	214	171	97	873	9.7	12.8	22.3	24.5	19.6	11.1
12	93	124	193	185	181	99	876	10.6	14.2	22.1	21.2	20.6	11.3
13	94	119	202	196	198	98	908	10.4	13.1	22.3	21.6	21.8	10.8
14	97	128	195	198	211	99	928	10.5	13.8	21.0	21.3	22.7	10.7
15	100	130	201	169	197	102	899	11.1	14.4	22.4	18.8	21.9	11.3
16	99	123	189	168	190	94	863	11.4	14.2	21.9	19.5	22.1	10.9

02 av 23-Feb-1990 15:51 DH1302 .FRQ Amplitude													
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	88	105	134	134	152	104	716	12.3	14.6	18.7	18.6	21.2	14.5
2	93	100	143	129	149	101	715	12.9	13.9	20.0	18.1	20.9	14.2
3	74	88	111	139	151	96	659	11.2	13.4	16.9	21.0	22.9	14.6
4	72	94	122	140	165	109	702	10.2	13.4	17.4	20.0	23.5	15.5
5	62	95	150	126	146	90	669	9.2	14.2	22.4	18.9	21.8	13.5
6	69	108	146	132	165	99	719	9.6	15.1	20.3	18.4	23.0	13.7
7	176	182	224	168	185	138	1072	16.5	17.0	20.9	15.7	17.2	12.9
8	190	189	235	178	194	130	1117	17.0	16.9	21.1	16.0	17.4	11.6
9	106	131	189	164	177	111	878	12.1	14.9	21.5	18.6	20.2	12.7
10	118	138	190	160	175	114	895	13.2	15.4	21.2	17.9	19.5	12.7
11	83	115	186	175	163	97	819	10.2	14.0	22.7	21.4	19.8	11.9
12	87	122	183	176	158	104	830	10.5	14.7	22.0	21.3	19.0	12.5
13	90	126	197	164	171	103	852	10.5	14.8	23.1	19.3	20.1	12.1
14	90	135	191	170	171	101	859	10.4	15.7	22.3	19.8	19.9	11.8
15	97	148	199	171	185	100	901	10.8	16.4	22.1	19.0	20.6	11.1
16	96	139	176	161	177	97	846	11.3	16.4	20.8	19.1	20.9	11.5

03			av	25-Feb-1990	12:47	EF1103	.FRQ	Amplitude					
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	99	104	123	106	208	186	825	11.9	12.6	14.9	12.8	25.2	22.5
2	106	119	153	121	178	139	817	13.0	14.6	18.7	14.9	21.8	17.1
3	62	80	101	117	384	256	999	6.2	8.0	10.1	11.7	38.5	25.6
4	95	112	158	162	407	229	1162	8.2	9.6	13.6	13.9	35.0	19.7
5	93	109	192	162	170	96	822	11.3	13.2	23.4	19.7	20.7	11.7
6	104	121	219	183	181	98	907	11.5	13.3	24.2	20.1	20.0	10.8
7	143	141	166	121	232	213	1016	14.1	13.9	16.3	11.9	22.9	21.0
8	146	144	172	124	219	198	1003	14.6	14.4	17.2	12.3	21.9	19.7
9	119	131	174	143	243	189	999	11.9	13.1	17.4	14.3	24.3	18.9
10	125	147	193	161	272	211	1110	11.3	13.2	17.4	14.5	24.5	19.0
11	105	127	187	186	165	101	871	12.1	14.6	21.4	21.3	19.0	11.6
12	108	131	200	189	179	105	911	11.8	14.4	21.9	20.7	19.6	11.5
13	112	126	241	245	180	93	997	11.2	12.6	24.1	24.6	18.0	9.4
14	118	134	231	231	189	94	997	11.8	13.4	23.2	23.2	19.0	9.4
15	125	147	295	281	198	92	1138	11.0	12.9	25.9	24.7	17.4	8.1
16	125	146	259	244	198	94	1065	11.7	13.7	24.3	22.9	18.6	8.8

03			av	25-Feb-1990	12:56	EF1203	.FRQ	Amplitude					
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	238	216	216	162	268	250	1352	17.6	16.0	16.0	12.0	19.8	18.5
2	269	223	252	167	209	138	1258	21.4	17.8	20.0	13.3	16.6	11.0
3	76	86	107	138	504	318	1230	6.2	7.0	8.7	11.2	41.0	25.8
4	141	141	183	175	511	289	1441	9.8	9.8	12.7	12.1	35.5	20.1
5	98	115	185	132	158	100	788	12.4	14.6	23.5	16.8	20.1	12.7
6	112	145	208	154	182	105	906	12.3	16.0	23.0	17.0	20.1	11.6
7	174	175	192	146	247	185	1118	15.5	15.6	17.1	13.0	22.1	16.6
8	194	170	202	146	230	170	1111	17.4	15.3	18.2	13.2	20.7	15.3
9	111	138	182	140	265	191	1026	10.8	13.5	17.7	13.6	25.8	18.6
10	146	159	201	158	280	184	1129	13.0	14.1	17.8	14.0	24.8	16.3
11	100	126	185	134	164	105	814	12.2	15.5	22.7	16.5	20.1	12.9
12	124	135	196	145	184	108	891	13.9	15.1	22.0	16.2	20.7	12.2
13	112	132	222	150	170	97	883	12.7	14.9	25.1	17.0	19.3	11.0
14	121	144	221	157	177	100	920	13.2	15.6	24.1	17.0	19.3	10.8
15	111	149	234	170	167	99	930	11.9	16.0	25.1	18.3	17.9	10.6
16	125	157	221	161	166	100	930	13.5	16.9	23.7	17.3	17.9	10.7

03			av	25-Feb-1990	13:05	EF1303	.FRQ	Amplitude					
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	143	128	140	112	177	136	835	17.1	15.3	16.8	13.4	21.2	16.3
2	156	155	192	153	178	110	944	16.5	16.5	20.4	16.2	18.8	11.7
3	87	91	114	141	521	332	1286	6.8	7.1	8.9	11.0	40.5	25.8
4	109	137	182	203	440	291	1362	8.0	10.1	13.4	14.9	32.3	21.4
5	91	115	167	125	154	97	749	12.2	15.3	22.3	16.7	20.5	12.9
6	117	141	194	164	183	113	913	12.9	15.4	21.3	18.0	20.1	12.4
7	209	201	231	157	197	137	1133	18.5	17.8	20.4	13.8	17.4	12.1
8	229	220	250	178	206	148	1230	18.6	17.9	20.3	14.5	16.7	12.0
9	133	144	186	149	232	140	984	13.5	14.7	18.9	15.2	23.6	14.2
10	141	157	211	175	228	153	1063	13.2	14.7	19.8	16.4	21.4	14.3
11	111	131	189	148	157	91	827	13.4	15.9	22.9	17.9	19.0	10.9
12	115	140	210	177	180	99	921	12.5	15.2	22.8	19.3	19.5	10.8
13	111	136	191	156	163	91	848	13.0	16.1	22.6	18.4	19.2	10.7
14	119	145	212	174	177	95	921	12.9	15.7	23.0	18.9	19.2	10.3
15	120	154	200	169	170	95	909	13.2	16.9	22.1	18.6	18.7	10.5
16	122	150	205	168	176	105	926	13.2	16.2	22.1	18.1	19.0	11.4

04			av	07-Mar-1990	04:28	EM1104	.FRQ	Amplitude						
Channel	Absolute Activity							Relative Activity						
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2	
1	76	95	130	123	130	82	635	11.9	15.0	20.5	19.3	20.5	12.9	
2	84	105	138	140	147	86	699	12.0	14.9	19.7	20.0	21.0	12.4	
3	76	104	137	137	205	196	855	8.9	12.2	16.1	16.0	24.0	22.9	
4	64	96	121	110	190	221	803	8.0	11.9	15.0	13.8	23.7	27.6	
5	76	95	137	186	126	85	704	10.8	13.4	19.4	26.4	17.9	12.0	
6	82	113	171	215	142	91	814	10.1	13.9	21.0	26.4	17.4	11.2	
7	95	110	169	152	160	125	811	11.7	13.6	20.9	18.7	19.8	15.4	
8	97	113	159	154	159	104	785	12.4	14.4	20.2	19.6	20.3	13.2	
9	105	141	222	203	179	96	945	11.2	14.9	23.5	21.4	18.9	10.2	
10	106	143	215	201	185	100	950	11.1	15.1	22.6	21.2	19.4	10.5	
11	91	129	206	216	159	85	887	10.3	14.6	23.2	24.3	18.0	9.6	
12	89	128	203	225	156	85	885	10.0	14.4	22.9	25.4	17.7	9.6	
13	108	138	206	257	168	83	959	11.2	14.3	21.5	26.7	17.5	8.6	
14	109	137	220	278	171	88	1002	10.8	13.7	22.0	27.7	17.1	8.8	
15	123	131	186	363	182	111	1095	11.2	12.0	17.0	33.1	16.6	10.1	
16	116	133	201	360	195	126	1131	10.2	11.8	17.8	31.9	17.2	11.2	

04			av	07-Mar-1990	04:37	EM1204	.FRQ	Amplitude						
Channel	Absolute Activity							Relative Activity						
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2	
1	206	180	206	155	152	121	1020	20.2	17.6	20.2	15.2	14.9	11.9	
2	239	226	250	185	208	149	1256	19.0	18.0	19.9	14.7	16.6	11.9	
3	86	112	147	124	162	145	776	11.1	14.4	19.0	16.0	20.8	18.7	
4	78	104	126	102	144	161	715	10.9	14.6	17.6	14.2	20.1	22.6	
5	72	105	164	146	145	122	755	9.5	13.9	21.8	19.4	19.2	16.2	
6	87	119	182	176	146	111	821	10.6	14.5	22.1	21.5	17.8	13.6	
7	118	130	185	162	174	152	921	12.8	14.1	20.1	17.6	18.9	16.5	
8	121	135	191	160	188	144	939	12.9	14.4	20.3	17.1	20.0	15.3	
9	115	151	226	191	187	124	993	11.6	15.2	22.8	19.2	18.8	12.5	
10	122	154	242	189	201	145	1054	11.5	14.6	23.0	18.0	19.1	13.8	
11	103	135	213	192	164	116	923	11.1	14.7	23.0	20.8	17.8	12.6	
12	99	134	208	203	166	114	924	10.7	14.5	22.6	22.0	18.0	12.3	
13	104	140	209	189	168	115	926	11.3	15.1	22.6	20.4	18.2	12.4	
14	112	150	217	213	178	112	981	11.4	15.3	22.1	21.7	18.1	11.4	
15	101	142	230	211	178	130	992	10.2	14.3	23.1	21.2	18.0	13.1	
16	103	135	204	239	182	119	983	10.5	13.8	20.8	24.3	18.6	12.1	

04			av	07-Mar-1990	04:48	EM1304	.FRQ	Amplitude						
Channel	Absolute Activity							Relative Activity						
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2	
1	96	113	137	134	176	174	831	11.6	13.6	16.5	16.1	21.2	20.9	
2	114	127	166	138	184	172	902	12.6	14.1	18.4	15.3	20.4	19.1	
3	82	105	138	126	206	222	878	9.4	11.9	15.7	14.3	23.5	25.2	
4	65	98	121	113	229	265	891	7.3	11.0	13.6	12.7	25.7	29.8	
5	76	104	131	139	164	167	781	9.7	13.3	16.8	17.8	21.0	21.3	
6	88	119	164	161	169	158	860	10.3	13.9	19.1	18.7	19.6	18.4	
7	147	183	231	194	215	178	1148	12.8	15.9	20.2	16.9	18.7	15.5	
8	148	181	228	186	207	172	1122	13.2	16.1	20.4	16.5	18.5	15.3	
9	110	152	230	204	214	174	1084	10.1	14.0	21.2	18.8	19.8	16.1	
10	113	148	220	199	226	197	1104	10.3	13.4	19.9	18.0	20.5	17.9	
11	95	131	208	207	187	161	989	9.6	13.3	21.0	20.9	18.9	16.3	
12	95	132	198	218	186	160	989	9.6	13.3	20.1	22.0	18.8	16.2	
13	105	142	188	187	193	163	977	10.7	14.5	19.3	19.1	19.7	16.7	
14	111	147	203	196	193	161	1011	11.0	14.6	20.1	19.4	19.1	15.9	
15	113	149	173	186	196	178	996	11.4	15.0	17.3	18.7	19.7	17.9	
16	105	139	177	192	194	164	971	10.8	14.3	18.3	19.8	20.0	16.9	

05 av 07-Mar-1990 07:44 D01105 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	127	154	185	141	156	110	872	14.5	17.7	21.2	16.1	17.9	12.6
2	106	151	172	138	147	115	829	12.8	18.2	20.8	16.6	17.8	13.9
3	83	131	152	124	211	197	897	9.3	14.6	16.9	13.8	23.5	21.9
4	82	139	165	143	277	306	1111	7.4	12.5	14.8	12.8	24.9	27.5
5	90	132	181	193	147	92	835	10.7	15.8	21.7	23.1	17.6	11.0
6	90	136	209	228	169	95	927	9.7	14.6	22.6	24.6	18.2	10.3
7	149	203	232	167	171	113	1035	14.4	19.6	22.4	16.2	16.5	10.9
8	152	207	241	171	173	118	1061	14.3	19.5	22.7	16.1	16.3	11.1
9	156	211	283	195	204	133	1182	13.2	17.8	23.9	16.5	17.3	11.2
10	162	212	279	199	207	143	1201	13.5	17.6	23.2	16.6	17.2	11.9
11	132	191	270	198	182	114	1087	12.1	17.6	24.9	18.2	16.8	10.5
12	123	174	255	207	172	113	1044	11.8	16.6	24.4	19.9	16.5	10.8
13	115	185	266	232	176	96	1070	10.8	17.3	24.9	21.7	16.5	9.0
14	108	177	259	257	181	94	1076	10.1	16.5	24.0	23.9	16.8	8.7
15	134	178	248	366	216	121	1264	10.6	14.1	19.6	28.9	17.1	9.6
16	135	163	256	457	227	108	1346	10.0	12.1	19.0	34.0	16.9	8.0

05 av 07-Mar-1990 07:53 D01205 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	142	156	203	140	163	135	939	15.2	16.6	21.6	14.9	17.4	14.4
2	159	175	199	143	176	124	978	16.3	17.9	20.4	14.6	18.0	12.7
3	83	121	168	106	159	121	758	10.9	15.9	22.2	14.0	20.9	16.0
4	91	148	183	128	241	243	1033	8.8	14.4	17.7	12.3	23.3	23.5
5	83	144	216	150	162	102	856	9.7	16.8	25.2	17.5	18.9	11.9
6	96	144	259	165	177	101	943	10.2	15.3	27.5	17.5	18.8	10.8
7	131	169	228	169	185	130	1012	13.0	16.7	22.6	16.7	18.3	12.8
8	145	185	242	174	202	131	1079	13.4	17.1	22.4	16.1	18.8	12.2
9	145	207	288	187	217	145	1189	12.2	17.4	24.2	15.7	18.2	12.2
10	159	206	255	187	225	160	1192	13.3	17.2	21.4	15.7	18.9	13.4
11	115	185	265	173	193	124	1055	10.9	17.5	25.1	16.4	18.3	11.8
12	113	167	229	168	190	120	988	11.4	16.9	23.2	17.0	19.3	12.2
13	111	177	261	178	185	102	1013	11.0	17.5	25.7	17.5	18.2	10.0
14	113	161	244	175	193	103	989	11.4	16.3	24.7	17.7	19.5	10.4
15	109	199	352	227	234	123	1245	8.8	16.0	28.3	18.2	18.8	9.9
16	107	183	344	216	222	120	1192	9.0	15.3	28.8	18.1	18.7	10.0

05 av 07-Mar-1990 08:01 D01305 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	119	159	214	151	193	173	1009	11.8	15.8	21.3	14.9	19.1	17.1
2	115	154	195	145	193	179	982	11.7	15.7	19.9	14.8	19.7	18.2
3	77	135	185	123	215	207	942	8.1	14.4	19.6	13.1	22.8	22.0
4	79	148	184	139	280	302	1132	7.0	13.0	16.3	12.3	24.7	26.7
5	87	142	183	148	255	229	1044	8.4	13.6	17.5	14.2	24.4	21.9
6	101	150	206	156	248	204	1063	9.5	14.1	19.3	14.6	23.3	19.1
7	178	231	293	193	213	174	1281	13.9	18.0	22.9	15.1	16.6	13.6
8	200	254	312	204	219	175	1365	14.7	18.6	22.9	14.9	16.1	12.9
9	141	210	270	195	232	182	1230	11.5	17.1	21.9	15.8	18.8	14.8
10	152	222	278	187	242	208	1288	11.8	17.2	21.5	14.5	18.8	16.1
11	120	187	250	184	216	169	1126	10.7	16.6	22.2	16.4	19.2	15.0
12	113	189	239	168	211	169	1089	10.4	17.4	21.9	15.4	19.4	15.5
13	112	185	240	178	215	159	1089	10.3	17.0	22.0	16.4	19.7	14.6
14	126	191	234	171	217	159	1096	11.5	17.4	21.3	15.6	19.8	14.5
15	116	189	294	210	240	161	1211	9.6	15.6	24.3	17.3	19.8	13.3
16	127	198	284	220	249	162	1240	10.2	16.0	22.9	17.8	20.1	13.0

06 av 09-Mar-1990 11:55 BR1106 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	91	120	207	172	136	89	816	11.2	14.7	25.4	21.1	16.7	10.9
2	87	119	171	161	143	97	778	11.2	15.3	22.0	20.7	18.3	12.5
3	67	91	175	166	126	87	713	9.4	12.8	24.6	23.3	17.6	12.2
4	68	94	139	141	149	131	722	9.4	13.0	19.3	19.5	20.7	18.2
5	65	90	168	215	158	115	813	8.0	11.1	20.7	26.5	19.5	14.2
6	69	84	145	202	141	110	751	9.2	11.2	19.3	26.9	18.8	14.6
7	150	197	307	206	210	230	1300	11.6	15.2	23.6	15.8	16.1	17.7
8	144	183	280	202	175	163	1147	12.6	16.0	24.4	17.6	15.2	14.2
9	127	181	306	244	184	113	1156	11.0	15.7	26.5	21.1	15.9	9.8
10	134	174	282	236	185	123	1134	11.8	15.4	24.9	20.8	16.3	10.8
11	90	136	235	224	162	93	939	9.5	14.5	25.0	23.8	17.2	9.9
12	95	134	228	232	164	97	951	10.0	14.1	24.0	24.4	17.3	10.2
13	98	125	220	303	177	101	1024	9.6	12.2	21.5	29.6	17.3	9.8
14	105	121	220	364	185	103	1097	9.6	11.1	20.1	33.1	16.8	9.4
15	95	121	199	490	243	184	1330	7.2	9.1	14.9	36.8	18.2	13.8
16	89	108	182	422	221	179	1201	7.4	9.0	15.1	35.1	18.4	14.9

06 av 09-Mar-1990 12:03 BR1206 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	154	192	258	170	168	132	1074	14.3	17.9	24.1	15.8	15.6	12.3
2	199	195	262	175	202	158	1190	16.7	16.4	22.0	14.7	17.0	13.3
3	81	119	187	160	234	228	1009	8.0	11.8	18.5	15.9	23.2	22.6
4	89	102	180	124	149	124	768	11.6	13.3	23.5	16.1	19.4	16.1
5	79	104	176	188	193	149	889	8.9	11.7	19.8	21.1	21.7	16.8
6	84	93	165	155	159	135	790	10.7	11.7	20.9	19.6	20.1	17.1
7	153	211	352	197	209	214	1337	11.5	15.8	26.3	14.8	15.6	16.0
8	164	203	340	199	239	250	1395	11.7	14.5	24.4	14.3	17.1	17.9
9	139	194	331	218	192	135	1210	11.5	16.1	27.3	18.1	15.9	11.2
10	147	192	330	233	209	156	1266	11.6	15.2	26.1	18.4	16.5	12.3
11	102	148	264	201	170	121	1006	10.2	14.7	26.2	20.0	16.9	12.0
12	104	141	252	204	171	127	998	10.4	14.1	25.2	20.4	17.1	12.8
13	102	134	243	226	186	123	1015	10.0	13.2	24.0	22.3	18.3	12.2
14	98	125	217	221	177	122	961	10.3	13.0	22.6	23.0	18.4	12.7
15	89	117	204	218	232	147	1007	8.8	11.6	20.3	21.7	23.0	14.6
16	81	108	211	190	200	137	927	8.8	11.7	22.7	20.4	21.6	14.8

06 av 09-Mar-1990 12:12 BR1306 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	101	128	201	153	173	144	900	11.2	14.2	22.3	17.0	19.3	16.0
2	103	127	199	162	171	144	905	11.4	14.0	21.9	17.9	18.8	15.9
3	74	94	172	186	302	268	1095	6.7	8.6	15.7	17.0	27.5	24.4
4	62	93	149	136	161	146	747	8.3	12.5	19.9	18.1	21.6	19.5
5	74	106	185	196	219	217	997	7.4	10.7	18.5	19.6	22.0	21.8
6	63	97	142	151	227	228	909	7.0	10.7	15.6	16.6	25.0	25.1
7	185	199	339	227	199	147	1296	14.3	15.4	26.1	17.5	15.3	11.4
8	200	206	352	227	205	187	1377	14.5	15.0	25.5	16.5	14.9	13.6
9	138	199	313	221	194	149	1214	11.3	16.4	25.8	18.2	16.0	12.3
10	132	188	301	226	210	170	1226	10.8	15.3	24.5	18.4	17.1	13.9
11	101	157	238	190	177	140	1002	10.1	15.7	23.7	18.9	17.6	13.9
12	90	150	228	205	176	139	988	9.1	15.2	23.1	20.7	17.8	14.1
13	95	138	202	202	187	154	978	9.7	14.1	20.7	20.7	19.1	15.8
14	86	136	191	191	189	144	936	9.2	14.5	20.4	20.4	20.2	15.4
15	77	116	193	179	186	124	876	8.8	13.2	22.0	20.5	21.3	14.2
16	71	111	170	157	165	118	792	9.0	14.0	21.4	19.8	20.8	14.9

07 av 18-Mar-1990 19:02 B01107 .FRQ Amplitude													
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	77	94	113	95	117	88	584	13.2	16.0	19.3	16.3	20.0	15.1
2	91	108	138	122	142	99	700	13.0	15.4	19.7	17.5	20.3	14.2
3	65	85	108	92	108	91	550	11.8	15.6	19.7	16.7	19.6	16.6
4	76	101	131	120	142	97	666	11.3	15.2	19.6	18.0	21.4	14.5
5	76	112	140	159	151	91	729	10.4	15.4	19.2	21.8	20.7	12.5
6	84	102	134	129	121	73	643	13.0	15.9	20.9	20.1	18.8	11.3
7	101	132	161	129	142	123	787	12.8	16.8	20.4	16.4	18.0	15.6
8	106	133	161	135	172	175	881	12.0	15.1	18.3	15.3	19.5	19.9
9	94	134	192	144	161	104	829	11.4	16.2	23.1	17.3	19.4	12.5
10	101	138	193	155	172	113	872	11.6	15.8	22.1	17.7	19.8	13.0
11	86	122	181	151	154	92	786	10.9	15.5	23.1	19.2	19.6	11.7
12	86	130	196	177	161	93	844	10.2	15.4	23.2	21.0	19.1	11.1
13	106	135	188	203	156	88	877	12.1	15.5	21.5	23.2	17.8	10.0
14	104	144	195	198	177	95	914	11.4	15.8	21.4	21.7	19.4	10.4
15	125	146	157	252	176	97	953	13.1	15.3	16.4	26.4	18.5	10.2
16	121	140	150	262	194	124	991	12.2	14.1	15.1	26.5	19.5	12.6

07 av 18-Mar-1990 19:10 B01207 .FRQ Amplitude													
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	141	135	166	115	124	88	768	18.3	17.5	21.6	14.9	16.2	11.5
2	180	165	207	146	168	112	977	18.4	16.9	21.2	14.9	17.2	11.5
3	70	86	115	83	107	84	546	12.9	15.8	21.1	15.3	19.6	15.4
4	94	115	147	117	138	95	706	13.3	16.3	20.8	16.6	19.5	13.5
5	81	105	156	130	137	85	692	11.7	15.2	22.5	18.7	19.7	12.2
6	70	93	137	114	109	66	588	11.8	15.8	23.2	19.3	18.6	11.2
7	108	127	175	127	149	115	802	13.4	15.9	21.8	15.9	18.6	14.4
8	107	136	180	135	171	126	855	12.5	15.9	21.0	15.8	20.0	14.7
9	97	132	196	144	157	102	829	11.8	15.9	23.6	17.4	19.0	12.4
10	112	143	199	146	168	112	881	12.7	16.2	22.6	16.6	19.1	12.8
11	90	123	184	150	144	89	779	11.5	15.7	23.6	19.2	18.5	11.4
12	102	137	184	155	154	91	825	12.4	16.6	22.4	18.8	18.7	11.0
13	98	127	181	177	152	82	816	12.1	15.5	22.1	21.6	18.6	10.1
14	119	141	193	172	161	90	876	13.6	16.1	22.0	19.7	18.4	10.3
15	90	121	174	154	157	89	784	11.4	15.4	22.2	19.6	20.0	11.4
16	93	118	182	163	162	104	821	11.3	14.3	22.1	19.9	19.7	12.6

07 av 18-Mar-1990 19:19 B01307 .FRQ Amplitude													
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	88	92	124	95	130	106	635	13.9	14.5	19.5	15.0	20.4	16.7
2	107	120	155	122	157	121	783	13.7	15.4	19.8	15.6	20.0	15.5
3	67	81	110	85	149	129	621	10.7	13.1	17.8	13.7	24.0	20.7
4	84	107	139	116	182	155	783	10.7	13.7	17.8	14.8	23.2	19.8
5	85	112	146	130	165	116	755	11.2	14.9	19.4	17.3	21.8	15.4
6	78	99	127	104	118	84	609	12.8	16.3	20.9	17.0	19.3	13.7
7	192	206	247	168	177	127	1115	17.2	18.4	22.1	15.0	15.9	11.4
8	186	205	249	173	185	142	1140	16.3	18.0	21.8	15.2	16.2	12.5
9	107	129	185	138	167	112	838	12.7	15.4	22.1	16.5	19.9	13.4
10	116	147	193	146	175	131	908	12.8	16.2	21.2	16.1	19.2	14.4
11	92	111	187	136	171	127	825	11.1	13.5	22.7	16.5	20.8	15.4
12	102	137	201	161	183	151	936	10.9	14.7	21.5	17.2	19.6	16.1
13	104	134	189	137	153	101	816	12.7	16.4	23.1	16.7	18.7	12.3
14	117	152	195	151	172	110	896	13.0	17.0	21.7	16.8	19.2	12.3
15	108	142	165	146	168	115	845	12.8	16.8	19.6	17.3	19.9	13.7
16	108	135	163	176	235	190	1007	10.7	13.4	16.2	17.5	23.3	18.9

08 av 19-Mar-1990 03:48 JR1108 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	116	138	173	144	143	97	811	14.4	17.0	21.4	17.7	17.6	12.0
2	130	167	197	146	165	131	937	13.9	17.9	21.0	15.6	17.7	13.9
3	104	131	165	157	151	105	813	12.8	16.1	20.3	19.3	18.5	12.9
4	95	131	170	153	180	143	872	10.9	15.0	19.5	17.5	20.7	16.4
5	121	147	211	194	191	132	996	12.1	14.8	21.2	19.5	19.2	13.3
6	105	137	191	172	164	118	887	11.8	15.4	21.6	19.4	18.5	13.3
7	128	173	204	145	167	123	940	13.6	18.4	21.7	15.4	17.7	13.1
8	125	183	215	150	180	134	988	12.7	18.5	21.8	15.2	18.3	13.5
9	141	208	256	176	206	136	1124	12.6	18.5	22.8	15.6	18.4	12.1
10	140	217	263	178	192	129	1119	12.5	19.4	23.5	15.9	17.1	11.5
11	118	183	248	167	165	94	975	12.1	18.7	25.4	17.2	16.9	9.7
12	108	164	239	163	158	95	926	11.6	17.7	25.8	17.6	17.1	10.2
13	122	167	240	205	162	85	982	12.4	17.0	24.5	20.9	16.5	8.6
14	121	158	232	198	166	89	963	12.5	16.4	24.1	20.5	17.2	9.3
15	145	185	269	300	172	90	1161	12.5	15.9	23.1	25.8	14.8	7.7
16	153	189	256	264	173	97	1134	13.5	16.7	22.6	23.3	15.3	8.6

08 av 19-Mar-1990 03:56 JR1208 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	208	211	261	166	179	127	1152	18.1	18.3	22.7	14.4	15.5	11.0
2	236	240	284	176	213	154	1304	18.1	18.4	21.8	13.5	16.3	11.8
3	114	134	191	126	159	119	844	13.5	15.9	22.6	15.0	18.9	14.1
4	111	148	176	138	186	160	919	12.1	16.1	19.2	15.0	20.2	17.5
5	119	159	254	177	279	246	1234	9.6	12.9	20.6	14.3	22.6	19.9
6	115	143	201	146	229	196	1030	11.1	13.9	19.5	14.2	22.2	19.0
7	137	191	265	151	187	152	1083	12.6	17.6	24.5	14.0	17.3	14.0
8	145	199	267	159	206	161	1136	12.7	17.5	23.5	14.0	18.1	14.1
9	150	215	288	167	196	130	1147	13.0	18.8	25.2	14.6	17.1	11.4
10	156	230	299	179	207	153	1222	12.7	18.8	24.4	14.6	16.9	12.5
11	127	180	254	154	175	113	1002	12.7	18.0	25.3	15.3	17.4	11.3
12	129	168	246	158	168	111	980	13.1	17.1	25.1	16.1	17.1	11.4
13	144	166	239	154	177	114	994	14.5	16.7	24.1	15.5	17.8	11.5
14	137	165	244	156	176	115	993	13.8	16.6	24.6	15.7	17.7	11.6
15	152	198	409	197	190	119	1265	12.0	15.6	32.3	15.6	15.0	9.4
16	136	187	389	198	196	135	1242	11.0	15.0	31.4	16.0	15.8	10.9

08 av 19-Mar-1990 04:06 JR1308 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	134	156	228	183	243	221	1165	11.5	13.4	19.5	15.7	20.9	19.0
2	143	188	232	179	249	231	1224	11.7	15.4	19.0	14.7	20.4	18.9
3	112	149	214	197	251	237	1160	9.6	12.8	18.5	17.0	21.6	20.5
4	94	136	179	163	203	190	966	9.8	14.1	18.6	16.8	21.0	19.7
5	115	163	223	200	344	321	1366	8.4	12.0	16.3	14.7	25.1	23.5
6	113	152	204	168	236	214	1088	10.4	14.0	18.8	15.5	21.7	19.7
7	189	223	302	215	268	225	1422	13.3	15.7	21.2	15.1	18.8	15.8
8	183	237	311	213	270	230	1443	12.7	16.4	21.6	14.7	18.7	15.9
9	156	204	284	201	258	226	1329	11.7	15.3	21.4	15.1	19.4	17.0
10	158	229	293	213	264	230	1386	11.4	16.5	21.1	15.4	19.0	16.6
11	132	189	255	183	241	216	1216	10.9	15.6	21.0	15.0	19.8	17.8
12	122	177	245	180	222	196	1141	10.7	15.5	21.4	15.8	19.5	17.2
13	124	188	251	184	254	218	1219	10.1	15.5	20.6	15.1	20.8	17.9
14	133	187	239	179	235	201	1174	11.3	15.9	20.4	15.2	20.0	17.1
15	152	224	331	210	267	221	1406	10.8	16.0	23.5	14.9	19.0	15.8
16	144	205	284	205	252	217	1307	11.0	15.7	21.7	15.6	19.3	16.6

09 av 19-Mar-1990 11:32 KM1109 .FRQ Amplitude													
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	119	132	193	183	170	91	889	13.4	14.8	21.7	20.6	19.1	10.3
2	105	130	199	191	177	95	898	11.7	14.5	22.1	21.3	19.7	10.6
3	89	104	165	160	180	117	816	11.0	12.8	20.2	19.7	22.1	14.3
4	80	113	198	163	182	74	810	9.8	13.9	24.4	20.2	22.5	9.1
5	86	115	189	254	178	76	898	9.6	12.8	21.0	28.3	19.8	8.5
6	91	115	218	340	197	90	1052	8.6	11.0	20.7	32.3	18.8	8.6
7	159	193	250	236	199	102	1140	14.0	16.9	21.9	20.7	17.5	9.0
8	160	201	251	234	198	107	1151	13.9	17.4	21.8	20.3	17.2	9.3
9	146	184	297	282	234	115	1259	11.6	14.7	23.6	22.4	18.6	9.2
10	153	193	290	303	263	153	1355	11.3	14.2	21.4	22.4	19.4	11.3
11	108	162	286	374	213	109	1252	8.6	12.9	22.8	29.9	17.0	8.7
12	108	159	291	438	244	122	1363	7.9	11.7	21.4	32.2	17.9	9.0
13	112	163	286	387	219	94	1261	8.9	12.9	22.7	30.7	17.4	7.5
14	135	168	303	545	236	99	1486	9.1	11.3	20.4	36.6	15.9	6.7
15	133	177	292	437	265	106	1409	9.4	12.5	20.7	31.0	18.8	7.5
16	133	164	267	570	259	105	1499	8.9	10.9	17.8	38.0	17.3	7.0

09 av 19-Mar-1990 11:42 KM1209 .FRQ Amplitude													
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	119	128	178	163	164	95	847	14.1	15.1	21.0	19.2	19.3	11.2
2	107	131	178	159	180	103	858	12.4	15.3	20.8	18.5	21.0	12.0
3	89	103	144	137	170	105	748	11.9	13.7	19.2	18.4	22.8	14.0
4	81	112	172	140	169	83	757	10.7	14.8	22.8	18.5	22.3	11.0
5	83	120	188	177	165	77	810	10.2	14.8	23.2	21.9	20.4	9.5
6	85	119	207	219	184	86	900	9.4	13.3	23.0	24.3	20.5	9.5
7	146	176	230	211	189	106	1058	13.8	16.6	21.7	20.0	17.9	10.1
8	145	172	223	203	196	111	1050	13.8	16.4	21.3	19.4	18.7	10.5
9	127	175	290	264	224	113	1192	10.6	14.7	24.3	22.1	18.8	9.4
10	131	180	278	259	258	140	1246	10.5	14.5	22.3	20.8	20.7	11.3
11	101	152	275	354	210	114	1206	8.4	12.6	22.8	29.4	17.4	9.4
12	105	159	281	438	240	126	1350	7.8	11.8	20.8	32.5	17.8	9.4
13	114	149	286	289	223	100	1160	9.8	12.8	24.7	24.9	19.2	8.6
14	123	166	279	315	222	100	1206	10.2	13.7	23.2	26.2	18.4	8.3
15	113	167	305	288	263	113	1249	9.1	13.4	24.4	23.1	21.0	9.1
16	108	155	269	267	247	104	1150	9.4	13.5	23.4	23.2	21.5	9.0

09 av 19-Mar-1990 11:50 KM1309 .FRQ Amplitude													
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	114	127	186	150	182	106	865	13.1	14.6	21.5	17.3	21.1	12.3
2	105	118	176	154	176	113	841	12.4	14.1	20.9	18.3	20.9	13.5
3	72	93	156	125	157	101	705	10.1	13.3	22.2	17.8	22.3	14.3
4	77	105	181	142	198	156	859	9.0	12.2	21.1	16.5	23.0	18.1
5	79	106	163	153	180	134	814	9.7	13.0	20.0	18.8	22.1	16.4
6	87	117	177	172	211	181	945	9.2	12.4	18.7	18.2	22.3	19.2
7	168	173	230	185	195	114	1065	15.7	16.2	21.6	17.4	18.4	10.8
8	168	176	228	183	188	116	1059	15.9	16.6	21.5	17.3	17.7	11.0
9	129	164	270	198	227	123	1111	11.7	14.7	24.3	17.8	20.4	11.1
10	131	171	253	226	261	178	1220	10.7	14.0	20.8	18.6	21.4	14.6
11	105	151	249	191	181	103	980	10.7	15.4	25.4	19.5	18.5	10.6
12	110	146	244	302	200	129	1131	9.7	12.9	21.6	26.7	17.7	11.4
13	102	141	236	205	192	103	978	10.4	14.4	24.1	20.9	19.7	10.5
14	128	157	241	218	189	111	1046	12.2	15.0	23.3	20.8	18.0	10.6
15	102	146	234	216	243	124	1065	9.6	13.7	21.9	20.3	22.9	11.7
16	103	139	216	192	203	125	978	10.6	14.3	22.1	19.7	20.7	12.7

10 av 21-Mar-1990 03:26 PA1110 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	84	92	129	123	143	119	689	12.1	13.3	18.7	17.8	20.8	17.2
2	77	92	122	120	144	125	681	11.3	13.5	17.9	17.7	21.2	18.4
3	59	93	116	132	340	298	1039	5.7	8.9	11.1	12.7	32.8	28.7
4	57	84	97	114	281	301	933	6.1	9.0	10.4	12.2	30.1	32.2
5	77	110	141	182	139	90	737	10.4	14.9	19.1	24.6	18.8	12.2
6	74	99	136	192	136	83	719	10.2	13.8	18.9	26.7	18.9	11.5
7	97	96	132	123	138	107	694	14.0	13.8	19.1	17.7	20.0	15.4
8	93	94	132	124	141	123	707	13.1	13.4	18.6	17.5	20.0	17.5
9	93	125	186	166	166	111	848	11.0	14.8	21.9	19.6	19.6	13.0
10	104	131	185	164	204	174	962	10.8	13.7	19.2	17.0	21.2	18.1
11	85	132	195	187	141	82	822	10.4	16.1	23.7	22.8	17.1	9.9
12	89	134	201	190	147	85	846	10.5	15.9	23.7	22.5	17.4	10.0
13	98	133	186	229	149	82	877	11.1	15.2	21.2	26.1	17.0	9.4
14	95	128	183	243	150	79	879	10.8	14.6	20.9	27.6	17.1	9.0
15	113	146	184	288	181	112	1024	11.1	14.2	18.0	28.1	17.7	11.0
16	103	123	167	287	176	100	955	10.8	12.9	17.5	30.0	18.4	10.4

10 av 21-Mar-1990 03:35 PA1210 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	112	119	168	127	151	116	794	14.2	15.0	21.1	16.0	19.1	14.6
2	116	107	150	134	171	139	817	14.2	13.0	18.4	16.4	21.0	17.0
3	67	97	126	129	398	373	1190	5.6	8.1	10.6	10.9	33.4	31.3
4	65	80	111	114	341	397	1109	5.9	7.2	10.0	10.3	30.8	35.8
5	71	111	153	132	142	88	697	10.2	15.9	21.9	18.9	20.4	12.6
6	67	97	139	133	124	74	633	10.5	15.3	22.0	21.0	19.6	11.6
7	97	120	153	127	147	102	746	13.0	16.1	20.6	17.0	19.7	13.7
8	94	116	149	129	153	103	745	12.7	15.6	20.0	17.4	20.6	13.8
9	90	131	192	146	158	96	813	11.1	16.1	23.6	18.0	19.4	11.8
10	104	129	185	154	171	119	861	12.1	15.0	21.5	17.9	19.8	13.9
11	84	123	179	143	142	81	751	11.2	16.4	23.8	19.0	18.9	10.8
12	91	127	177	144	144	81	763	11.9	16.7	23.1	18.8	18.8	10.6
13	86	125	171	153	152	81	768	11.2	16.2	22.2	19.9	19.8	10.5
14	89	124	159	157	147	76	752	11.8	16.5	21.2	20.9	19.6	10.1
15	97	145	211	180	166	97	897	10.9	16.2	23.6	20.1	18.5	10.8
16	86	119	180	161	153	91	791	10.9	15.0	22.7	20.4	19.4	11.6

10 av 21-Mar-1990 03:44 PA1310 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	91	103	161	131	157	127	770	11.8	13.4	20.9	17.0	20.3	16.5
2	72	97	139	133	175	169	785	9.2	12.4	17.7	16.9	22.3	21.5
3	64	94	128	169	410	339	1205	5.3	7.8	10.7	14.0	34.0	28.2
4	61	82	109	133	395	469	1250	4.9	6.6	8.7	10.7	31.6	37.6
5	67	105	141	133	133	93	672	9.9	15.6	21.1	19.8	19.8	13.9
6	73	95	124	118	129	85	624	11.7	15.3	19.9	18.9	20.6	13.6
7	129	143	182	145	167	115	881	14.7	16.3	20.7	16.4	18.9	13.0
8	119	135	172	144	167	115	853	14.0	15.9	20.2	16.9	19.6	13.5
9	94	131	194	152	162	98	830	11.3	15.7	23.3	18.3	19.5	11.8
10	104	136	191	161	202	146	940	11.0	14.4	20.3	17.2	21.5	15.5
11	85	122	190	148	145	88	777	10.9	15.7	24.5	19.0	18.6	11.3
12	89	121	185	146	154	96	790	11.3	15.3	23.4	18.4	19.5	12.1
13	81	122	169	139	148	89	748	10.8	16.3	22.6	18.6	19.8	11.9
14	84	113	162	145	151	89	744	11.3	15.2	21.8	19.5	20.3	12.0
15	89	134	181	154	159	98	815	10.9	16.4	22.3	18.9	19.5	12.0
16	86	119	159	145	146	91	745	11.5	15.9	21.3	19.5	19.6	12.2

11 av 30-Mar-1990 18:56 TF1111 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	81	102	125	110	121	86	626	13.0	16.3	20.1	17.7	19.3	13.7
2	98	124	159	136	140	84	741	13.2	16.7	21.5	18.4	18.9	11.3
3	55	79	98	119	226	154	731	7.6	10.8	13.5	16.3	30.9	21.0
4	86	125	154	156	291	178	990	8.7	12.6	15.6	15.8	29.4	18.0
5	74	93	131	145	130	93	667	11.1	14.0	19.6	21.8	19.5	14.0
6	89	128	173	233	171	105	898	9.9	14.3	19.3	26.0	19.0	11.6
7	102	119	168	134	143	105	772	13.3	15.4	21.7	17.4	18.5	13.6
8	104	129	188	144	155	102	822	12.7	15.6	22.8	17.6	18.9	12.4
9	115	138	199	161	152	92	856	13.4	16.1	23.3	18.8	17.7	10.7
10	132	172	246	180	165	97	993	13.3	17.4	24.7	18.1	16.6	9.8
11	103	137	202	179	143	84	848	12.1	16.2	23.8	21.1	16.9	9.9
12	111	156	215	230	157	90	958	11.5	16.3	22.4	24.0	16.4	9.4
13	107	133	192	246	147	81	907	11.8	14.7	21.2	27.2	16.2	9.0
14	116	149	209	302	168	89	1033	11.2	14.4	20.3	29.2	16.2	8.7
15	121	143	195	409	182	96	1146	10.6	12.4	17.0	35.7	15.8	8.4
16	123	142	214	421	194	96	1191	10.4	12.0	18.0	35.4	16.3	8.1

11 av 30-Mar-1990 19:06 TF1211 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	135	138	168	118	133	95	787	17.2	17.6	21.4	14.9	16.9	12.1
2	160	156	203	151	168	106	944	17.0	16.5	21.5	16.0	17.8	11.3
3	63	82	117	128	444	367	1200	5.3	6.8	9.7	10.6	37.0	30.6
4	103	128	186	167	350	260	1195	8.6	10.7	15.6	14.0	29.3	21.8
5	73	108	168	117	159	107	733	10.0	14.7	23.0	16.0	21.7	14.6
6	98	129	202	184	208	148	968	10.1	13.3	20.8	19.0	21.5	15.2
7	121	121	175	133	159	132	842	14.4	14.4	20.8	15.9	18.8	15.7
8	152	142	200	149	170	112	924	16.4	15.3	21.7	16.2	18.4	12.1
9	117	135	209	152	153	95	860	13.7	15.7	24.3	17.7	17.8	11.0
10	147	169	251	178	167	101	1014	14.5	16.7	24.8	17.5	16.5	10.0
11	109	138	215	158	148	88	855	12.7	16.1	25.2	18.4	17.3	10.2
12	115	157	236	189	159	97	952	12.1	16.5	24.8	19.8	16.7	10.2
13	105	130	205	179	153	85	857	12.3	15.2	24.0	20.9	17.8	9.9
14	118	152	230	213	165	90	968	12.2	15.7	23.8	22.0	17.0	9.3
15	105	141	247	211	179	101	985	10.7	14.4	25.1	21.4	18.2	10.3
16	111	135	222	233	188	96	985	11.2	13.7	22.5	23.7	19.1	9.7

11 av 30-Mar-1990 19:14 TF1311 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	96	122	161	111	130	87	707	13.6	17.2	22.8	15.7	18.4	12.3
2	114	156	200	147	156	105	878	13.0	17.8	22.7	16.7	17.8	12.0
3	58	89	116	119	399	387	1168	5.0	7.6	9.9	10.2	34.2	33.1
4	91	137	180	175	391	296	1271	7.2	10.8	14.2	13.8	30.8	23.3
5	67	106	142	117	205	143	780	8.6	13.6	18.2	15.0	26.3	18.3
6	89	138	188	186	349	273	1223	7.3	11.3	15.4	15.2	28.5	22.3
7	145	161	244	138	156	111	956	15.2	16.9	25.6	14.5	16.3	11.6
8	142	177	268	160	170	106	1023	13.9	17.3	26.2	15.7	16.6	10.3
9	113	163	237	154	149	96	912	12.4	17.9	26.0	16.9	16.3	10.6
10	136	199	283	181	167	105	1071	12.7	18.6	26.4	16.9	15.6	9.8
11	101	159	222	158	147	95	883	11.5	18.0	25.1	17.9	16.7	10.8
12	109	176	236	167	160	102	950	11.5	18.5	24.8	17.6	16.8	10.8
13	101	150	194	159	155	96	856	11.8	17.5	22.7	18.6	18.1	11.3
14	112	169	215	166	177	115	954	11.8	17.8	22.6	17.4	18.5	12.0
15	107	163	206	194	201	147	1017	10.5	16.1	20.3	19.1	19.7	14.4
16	108	164	200	211	221	176	1080	10.0	15.2	18.5	19.5	20.5	16.3

12 av 30-Mar-1990 21:53 BM1112 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	89	115	172	153	128	79	736	12.1	15.6	23.4	20.8	17.4	10.7
2	100	131	171	173	141	81	798	12.5	16.5	21.5	21.7	17.7	10.2
3	86	120	172	168	113	61	720	11.9	16.7	23.9	23.3	15.6	8.5
4	90	134	184	184	125	65	781	11.5	17.1	23.6	23.5	16.0	8.4
5	96	136	202	285	148	72	939	10.3	14.4	21.5	30.4	15.8	7.6
6	120	148	226	302	170	83	1049	11.4	14.1	21.6	28.8	16.2	7.9
7	113	142	178	188	167	149	936	12.0	15.2	19.0	20.0	17.9	15.9
8	118	150	179	188	175	149	959	12.4	15.6	18.7	19.6	18.2	15.5
9	126	194	287	268	210	124	1209	10.4	16.1	23.8	22.2	17.4	10.3
10	133	189	263	269	224	145	1224	10.8	15.5	21.5	22.0	18.3	11.9
11	117	189	310	483	211	106	1417	8.3	13.3	21.9	34.1	14.9	7.5
12	123	171	282	481	208	99	1363	9.0	12.5	20.7	35.3	15.2	7.3
13	138	190	288	448	197	90	1351	10.2	14.1	21.3	33.1	14.6	6.7
14	159	186	283	384	199	94	1306	12.2	14.2	21.7	29.4	15.2	7.2
15	129	159	245	386	216	95	1230	10.5	12.9	19.9	31.4	17.5	7.8
16	134	156	235	372	203	101	1200	11.1	13.0	19.6	31.0	16.9	8.4

12 av 30-Mar-1990 22:02 BM1212 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	116	132	181	136	148	96	808	14.3	16.3	22.4	16.8	18.3	11.8
2	142	145	177	140	150	97	851	16.6	17.0	20.8	16.4	17.7	11.4
3	85	110	169	126	114	71	675	12.6	16.3	25.0	18.7	16.9	10.6
4	87	128	171	135	125	71	719	12.2	17.8	23.9	18.8	17.4	9.9
5	83	125	236	182	142	82	849	9.7	14.7	27.8	21.5	16.7	9.6
6	102	152	245	198	156	80	934	11.0	16.3	26.3	21.2	16.7	8.6
7	113	153	201	161	162	110	900	12.6	17.0	22.4	17.9	18.0	12.2
8	125	152	191	150	156	108	883	14.1	17.2	21.6	17.0	17.7	12.3
9	111	192	294	219	205	122	1142	9.7	16.8	25.7	19.1	17.9	10.7
10	125	184	260	204	209	136	1118	11.2	16.5	23.3	18.2	18.7	12.1
11	103	163	311	321	185	100	1183	8.7	13.8	26.3	27.1	15.7	8.4
12	106	172	287	337	187	96	1185	8.9	14.5	24.2	28.4	15.8	8.1
13	115	159	291	270	169	91	1095	10.5	14.5	26.6	24.6	15.5	8.3
14	125	188	283	242	177	89	1103	11.3	17.0	25.7	21.9	16.0	8.1
15	103	147	260	192	207	102	1011	10.1	14.6	25.7	19.0	20.5	10.1
16	102	143	249	194	213	102	1003	10.2	14.2	24.8	19.4	21.2	10.2

12 av 30-Mar-1990 22:10 BM1312 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	101	123	185	120	154	100	783	12.9	15.7	23.6	15.4	19.7	12.7
2	120	140	189	127	176	105	857	14.0	16.3	22.1	14.8	20.5	12.3
3	90	111	169	107	129	79	685	13.2	16.2	24.7	15.6	18.8	11.6
4	99	127	177	113	171	122	809	12.2	15.7	21.8	14.0	21.1	15.1
5	89	126	186	139	173	125	838	10.6	15.0	22.2	16.6	20.7	14.9
6	105	140	200	153	215	165	977	10.7	14.3	20.5	15.7	22.0	16.9
7	165	187	208	140	175	109	984	16.8	19.0	21.2	14.2	17.8	11.1
8	185	208	218	145	176	104	1035	17.9	20.1	21.0	14.0	17.0	10.0
9	123	183	296	190	208	122	1122	11.0	16.3	26.4	16.9	18.5	10.9
10	130	179	278	180	213	116	1095	11.9	16.3	25.4	16.4	19.4	10.6
11	106	168	283	193	177	101	1028	10.3	16.4	27.5	18.8	17.2	9.8
12	116	164	260	224	183	103	1051	11.0	15.6	24.7	21.4	17.4	9.8
13	118	168	262	177	177	98	1000	11.8	16.8	26.2	17.7	17.7	9.8
14	134	182	268	183	185	104	1056	12.7	17.2	25.4	17.3	17.5	9.8
15	112	160	243	166	190	100	971	11.5	16.5	25.0	17.1	19.6	10.3
16	112	162	234	166	198	101	974	11.5	16.6	24.1	17.1	20.4	10.3

13			av 01-Apr-1990	16:34 MB1113	.FRQ	Amplitude						
Channel	Absolute Activity							Relative Activity				
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	97	112	171	151	161	126	818	11.9	13.7	20.9	18.5	19.7	15.3
2	107	141	204	203	199	144	998	10.7	14.2	20.4	20.3	19.9	14.4
3	54	69	114	117	191	125	671	8.1	10.3	17.0	17.5	28.5	18.6
4	70	121	206	214	201	126	939	7.5	12.9	21.9	22.8	21.4	13.5
5	76	106	181	220	150	75	808	9.4	13.1	22.4	27.2	18.6	9.3
6	79	126	233	308	204	96	1045	7.5	12.0	22.2	29.5	19.5	9.2
7	94	120	193	187	227	265	1087	8.6	11.1	17.8	17.2	20.9	24.4
8	99	130	199	196	222	216	1063	9.3	12.2	18.7	18.5	20.9	20.4
9	118	160	273	246	272	208	1277	9.3	12.5	21.3	19.2	21.3	16.3
10	126	171	303	279	249	149	1277	9.8	13.4	23.7	21.9	19.5	11.7
11	105	147	279	351	218	124	1224	8.6	12.0	22.8	28.7	17.8	10.2
12	102	155	280	360	231	137	1265	8.0	12.2	22.1	28.4	18.3	10.9
13	87	127	258	350	213	99	1134	7.7	11.2	22.8	30.9	18.8	8.7
14	102	152	273	441	233	107	1308	7.8	11.6	20.9	33.7	17.8	8.2
15	109	139	263	413	212	90	1226	8.9	11.4	21.4	33.7	17.3	7.4
16	106	137	252	428	228	103	1256	8.5	10.9	20.1	34.1	18.2	8.2

13			av 01-Apr-1990	16:43 MB1213	.FRQ	Amplitude						
Channel	Absolute Activity							Relative Activity				
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	153	149	201	153	155	116	928	16.5	16.0	21.7	16.5	16.7	12.5
2	184	175	240	202	208	141	1149	16.0	15.2	20.9	17.6	18.1	12.2
3	57	73	121	107	272	168	798	7.1	9.2	15.1	13.4	34.1	21.1
4	92	125	202	193	203	129	946	9.8	13.3	21.4	20.4	21.5	13.7
5	73	98	198	168	137	71	746	9.8	13.2	26.5	22.6	18.4	9.5
6	76	128	228	226	185	86	928	8.2	13.8	24.5	24.3	19.9	9.2
7	114	147	207	175	207	220	1070	10.6	13.8	19.3	16.4	19.4	20.5
8	114	141	208	192	240	241	1136	10.0	12.4	18.3	16.9	21.2	21.2
9	124	148	251	228	224	144	1120	11.1	13.3	22.4	20.3	20.0	12.9
10	129	162	275	264	222	131	1183	10.9	13.7	23.3	22.3	18.8	11.0
11	110	145	240	287	192	105	1079	10.2	13.4	22.2	26.6	17.8	9.7
12	106	148	248	304	215	115	1136	9.4	13.0	21.9	26.8	18.9	10.1
13	90	126	236	277	180	89	998	9.0	12.6	23.7	27.8	18.0	8.9
14	100	149	249	340	204	96	1139	8.8	13.1	21.9	29.8	17.9	8.5
15	92	132	229	236	213	91	993	9.3	13.3	23.0	23.8	21.4	9.2
16	89	128	263	289	204	86	1058	8.4	12.1	24.8	27.3	19.3	8.1

13			av 01-Apr-1990	16:51 MB1313	.FRQ	Amplitude						
Channel	Absolute Activity							Relative Activity				
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	103	118	175	152	158	121	827	12.5	14.3	21.1	18.3	19.1	14.7
2	109	155	220	188	200	145	1018	10.7	15.2	21.6	18.5	19.7	14.3
3	53	70	122	112	272	175	803	6.6	8.8	15.2	13.9	33.8	21.8
4	73	123	196	167	225	210	995	7.4	12.4	19.7	16.8	22.6	21.1
5	76	95	158	149	136	82	697	10.8	13.6	22.7	21.5	19.5	11.8
6	81	118	201	178	174	97	848	9.6	13.9	23.7	20.9	20.5	11.4
7	180	218	271	207	213	192	1281	14.0	17.0	21.1	16.2	16.7	15.0
8	198	224	272	209	242	265	1409	14.0	15.9	19.3	14.8	17.2	18.8
9	120	151	269	243	224	142	1148	10.4	13.2	23.4	21.1	19.5	12.3
10	126	169	283	253	224	145	1200	10.5	14.1	23.6	21.1	18.7	12.1
11	100	132	250	227	174	103	987	10.1	13.4	25.4	23.0	17.6	10.5
12	106	142	245	232	195	113	1034	10.3	13.8	23.7	22.4	18.9	11.0
13	93	122	228	196	166	92	896	10.3	13.6	25.4	21.9	18.6	10.2
14	107	139	231	208	185	98	968	11.0	14.4	23.8	21.5	19.2	10.1
15	104	126	188	177	180	97	872	12.0	14.5	21.5	20.3	20.6	11.1
16	99	127	196	180	186	95	882	11.2	14.4	22.2	20.4	21.0	10.7

14 av 11-Apr-1990 05:54 JL1114 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	88	98	120	131	124	84	646	13.7	15.2	18.5	20.3	19.2	13.0
2	85	104	142	183	141	90	745	11.4	14.0	19.1	24.6	18.9	12.1
3	69	80	110	128	139	96	623	11.1	12.8	17.6	20.5	22.4	15.5
4	82	109	157	203	189	131	871	9.4	12.5	18.1	23.3	21.7	15.1
5	75	98	122	128	126	77	627	12.0	15.7	19.5	20.3	20.1	12.3
6	84	108	140	174	161	100	767	10.9	14.1	18.2	22.7	21.0	13.0
7	123	130	151	145	154	110	813	15.1	16.0	18.6	17.8	19.0	13.5
8	116	131	160	156	164	108	836	13.9	15.7	19.1	18.7	19.7	13.0
9	114	144	193	176	169	101	897	12.7	16.0	21.5	19.6	18.9	11.3
10	130	156	197	179	172	105	940	13.9	16.6	21.0	19.1	18.3	11.2
11	105	142	189	227	162	95	920	11.4	15.4	20.5	24.7	17.6	10.3
12	123	154	202	217	180	102	978	12.6	15.7	20.7	22.2	18.4	10.4
13	107	136	176	175	154	86	834	12.9	16.3	21.1	21.0	18.4	10.3
14	106	126	166	173	152	83	806	13.2	15.7	20.7	21.4	18.8	10.3
15	102	117	144	181	150	87	781	13.1	15.0	18.4	23.2	19.2	11.1
16	109	123	150	201	174	109	867	12.6	14.2	17.3	23.2	20.1	12.6

14 av 11-Apr-1990 06:04 JL1214 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	102	114	138	128	140	101	722	14.1	15.8	19.0	17.7	19.3	14.0
2	92	108	148	153	168	129	798	11.5	13.6	18.5	19.1	21.1	16.2
3	78	98	120	119	141	104	660	11.8	14.9	18.1	18.1	21.3	15.8
4	84	104	137	160	203	157	846	10.0	12.3	16.2	18.9	24.0	18.6
5	75	102	149	139	176	126	766	9.8	13.4	19.4	18.1	22.9	16.4
6	89	115	162	158	175	119	817	10.9	14.1	19.9	19.3	21.4	14.5
7	144	149	185	158	177	135	948	15.2	15.7	19.5	16.6	18.7	14.3
8	129	134	181	161	182	138	925	14.0	14.5	19.6	17.4	19.7	14.9
9	122	157	206	165	176	121	946	12.9	16.6	21.7	17.4	18.6	12.7
10	140	152	195	165	200	146	997	14.0	15.3	19.5	16.5	20.0	14.6
11	117	151	198	205	171	107	949	12.3	15.9	20.8	21.6	18.0	11.3
12	136	160	204	194	185	119	998	13.6	16.0	20.5	19.4	18.6	11.9
13	110	134	176	161	165	100	847	13.0	15.8	20.8	19.0	19.5	11.8
14	115	131	171	166	160	98	842	13.6	15.6	20.4	19.7	19.1	11.6
15	105	127	192	163	160	101	848	12.3	14.9	22.7	19.3	18.9	11.9
16	117	135	205	184	171	109	922	12.7	14.7	22.2	20.0	18.5	11.8

14 av 11-Apr-1990 06:13 JL1314 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	94	100	129	137	160	126	746	12.6	13.4	17.3	18.4	21.4	16.9
2	93	112	137	176	173	137	828	11.2	13.5	16.6	21.2	20.9	16.6
3	73	91	115	141	163	136	719	10.2	12.7	15.9	19.6	22.7	19.0
4	86	107	144	189	210	169	904	9.5	11.8	15.9	20.9	23.2	18.6
5	78	101	123	124	194	160	780	10.0	12.9	15.8	15.9	24.8	20.5
6	80	97	134	159	189	156	815	9.8	11.9	16.5	19.5	23.2	19.1
7	156	142	159	137	193	148	934	16.7	15.2	17.0	14.7	20.7	15.8
8	148	146	162	154	196	150	956	15.5	15.3	16.9	16.1	20.5	15.7
9	115	141	193	148	205	148	949	12.1	14.8	20.3	15.6	21.5	15.6
10	129	151	193	172	216	165	1027	12.6	14.7	18.8	16.8	21.0	16.1
11	104	134	182	155	186	135	896	11.6	15.0	20.3	17.3	20.7	15.1
12	111	148	200	191	203	147	1000	11.1	14.8	20.0	19.1	20.3	14.7
13	105	129	166	153	184	132	868	12.1	14.9	19.1	17.6	21.2	15.2
14	100	118	161	157	171	126	833	11.9	14.2	19.4	18.8	20.5	15.2
15	99	114	142	147	163	130	796	12.5	14.4	17.9	18.4	20.5	16.4
16	110	122	152	177	192	156	910	12.1	13.4	16.7	19.5	21.1	17.1

15 av 11-Apr-1990 09:29 JH1115 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	114	123	134	98	158	114	741	15.4	16.6	18.1	13.2	21.3	15.4
2	144	164	179	130	192	132	940	15.3	17.4	19.0	13.8	20.4	14.0
3	76	89	95	71	130	110	573	13.3	15.6	16.7	12.4	22.8	19.3
4	142	163	183	154	226	155	1024	13.9	15.9	17.9	15.1	22.1	15.2
5	138	156	184	137	180	172	967	14.3	16.1	19.0	14.1	18.6	17.7
6	166	207	233	176	209	131	1122	14.8	18.5	20.7	15.7	18.6	11.7
7	163	172	184	136	259	294	1208	13.5	14.3	15.2	11.3	21.4	24.3
8	190	196	200	155	286	240	1267	15.0	15.5	15.8	12.2	22.5	18.9
9	163	189	204	149	229	159	1092	14.9	17.3	18.7	13.7	20.9	14.6
10	182	210	235	161	246	173	1208	15.1	17.4	19.5	13.4	20.4	14.3
11	153	187	238	156	198	134	1066	14.3	17.6	22.3	14.7	18.6	12.6
12	199	240	279	194	237	153	1302	15.3	18.4	21.4	14.9	18.2	11.8
13	179	220	263	176	208	130	1175	15.2	18.7	22.4	15.0	17.7	11.0
14	183	227	259	175	193	109	1146	16.0	19.8	22.6	15.2	16.8	9.5
15	173	205	228	187	200	120	1112	15.5	18.5	20.5	16.8	18.0	10.8
16	183	220	262	223	221	132	1242	14.8	17.7	21.1	18.0	17.8	10.7

15 av 11-Apr-1990 09:37 JH1215 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	171	169	177	123	178	129	947	18.1	17.9	18.7	12.9	18.8	13.6
2	209	200	223	140	219	154	1162	18.0	17.9	19.2	12.7	18.9	13.2
3	79	94	101	88	173	159	693	11.4	13.5	14.5	12.7	24.9	22.9
4	149	164	191	140	258	177	1088	13.7	15.1	17.6	13.6	23.7	16.3
5	121	143	189	131	180	151	915	13.2	15.7	20.7	14.3	19.6	16.5
6	164	202	230	169	219	131	1115	14.7	18.1	20.6	15.2	19.6	11.8
7	157	189	200	147	262	251	1206	13.0	15.7	16.6	12.2	21.7	20.8
8	193	212	224	162	242	180	1213	15.9	17.5	18.5	13.3	20.0	14.8
9	150	192	218	154	249	172	1134	13.2	17.0	19.2	13.5	21.9	15.2
10	193	230	241	163	262	169	1258	15.3	18.3	19.1	13.0	20.8	13.4
11	157	189	238	157	208	143	1092	14.3	17.3	21.8	14.4	19.1	13.1
12	200	240	276	183	250	153	1302	15.4	18.4	21.2	14.0	19.2	11.7
13	180	211	246	165	218	134	1155	15.6	18.3	21.3	14.3	18.9	11.6
14	180	216	246	161	202	109	1114	16.2	19.4	22.0	14.5	18.1	9.7
15	150	195	278	193	200	126	1143	13.1	17.1	24.3	16.9	17.5	11.1
16	171	212	272	201	221	138	1215	14.1	17.4	22.4	16.5	18.2	11.4

15 av 11-Apr-1990 09:51 JH1315 .FRQ Amplitude

Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	128	134	148	108	200	188	906	14.1	14.8	16.4	12.0	22.0	20.8
2	141	163	185	135	226	185	1035	13.6	15.7	17.8	13.0	21.9	17.9
3	94	98	106	86	243	207	834	11.2	11.8	12.8	10.3	29.2	24.8
4	135	163	185	158	309	247	1198	11.2	13.6	15.5	13.2	25.8	20.6
5	109	146	164	135	219	182	956	11.4	15.3	17.2	14.1	22.9	19.0
6	169	194	219	168	244	168	1162	14.5	16.7	18.9	14.4	21.0	14.5
7	186	212	231	171	292	394	1486	12.5	14.2	15.5	11.5	19.7	26.5
8	208	218	231	189	315	286	1445	14.4	15.1	16.0	13.1	21.8	19.8
9	167	199	218	159	250	232	1225	13.6	16.2	17.8	12.9	20.5	19.0
10	191	213	237	167	274	225	1308	14.6	16.3	18.2	12.8	20.9	17.2
11	154	199	241	157	204	166	1122	13.8	17.8	21.5	14.0	18.2	14.8
12	192	231	283	192	239	180	1317	14.5	17.6	21.5	14.6	18.2	13.6
13	161	219	251	177	226	158	1192	13.5	18.3	21.1	14.9	18.9	13.3
14	173	212	245	167	199	128	1124	15.4	18.9	21.8	14.9	17.7	11.3
15	142	188	240	179	199	149	1096	12.9	17.1	21.9	16.3	18.2	13.6
16	164	209	254	195	229	163	1214	13.5	17.2	20.9	16.1	18.9	13.4

16			av	22-Apr-1990	17:12	ST1116	.FRQ	Amplitude				
Channel	Absolute Activity							Relative Activity				
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	96	136	199	154	141	98	824	11.6	16.5	24.2	18.7	17.1	11.9
2	103	156	238	193	171	126	988	10.5	15.8	24.1	19.5	17.3	12.8
3	78	112	181	152	129	97	749	10.4	15.0	24.1	20.3	17.3	13.0
4	75	116	194	163	145	98	791	9.4	14.7	24.5	20.6	18.4	12.4
5	103	152	293	301	165	85	1099	9.4	13.9	26.6	27.4	15.0	7.7
6	90	152	294	270	171	94	1071	8.4	14.2	27.5	25.2	15.9	8.8
7	163	203	280	188	179	164	1177	13.8	17.2	23.8	16.0	15.2	13.9
8	154	193	275	198	189	141	1150	13.4	16.8	23.9	17.2	16.4	12.2
9	134	218	329	244	220	124	1268	10.5	17.2	25.9	19.3	17.3	9.7
10	131	224	326	245	218	137	1280	10.2	17.5	25.5	19.1	17.0	10.7
11	120	206	348	346	214	115	1349	8.9	15.3	25.8	25.6	15.9	8.5
12	121	225	357	353	215	113	1384	8.8	16.3	25.8	25.5	15.6	8.1
13	122	203	388	421	217	100	1452	8.4	14.0	26.7	29.0	15.0	6.9
14	115	197	362	350	205	98	1328	8.7	14.9	27.3	26.4	15.4	7.4
15	157	213	427	573	234	106	1711	9.2	12.5	25.0	33.5	13.7	6.2
16	150	204	416	441	215	100	1527	9.8	13.4	27.3	28.9	14.1	6.6

16			av	22-Apr-1990	17:19	ST1216	.FRQ	Amplitude				
Channel	Absolute Activity							Relative Activity				
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	133	158	221	147	146	101	906	14.7	17.4	24.4	16.3	16.1	11.1
2	164	187	265	190	189	120	1115	14.7	16.8	23.8	17.0	17.0	10.7
3	79	120	190	131	142	102	763	10.4	15.7	24.8	17.2	18.6	13.3
4	87	119	202	147	149	114	818	10.6	14.6	24.7	18.0	18.2	13.9
5	93	169	356	245	165	103	1131	8.3	15.0	31.5	21.6	14.6	9.1
6	95	161	333	224	180	130	1123	8.4	14.4	29.6	20.0	16.0	11.6
7	125	188	271	183	203	200	1171	10.6	16.1	23.1	15.7	17.4	17.1
8	139	191	281	192	216	176	1194	11.6	16.0	23.6	16.1	18.1	14.7
9	119	211	343	244	214	116	1247	9.6	16.9	27.5	19.6	17.1	9.3
10	132	219	339	233	214	117	1256	10.5	17.5	27.0	18.6	17.1	9.3
11	117	201	367	328	206	103	1321	8.9	15.2	27.7	24.8	15.6	7.8
12	122	212	394	360	220	104	1412	8.6	15.0	27.9	25.5	15.6	7.3
13	129	214	505	416	210	92	1566	8.2	13.7	32.2	26.6	13.4	5.9
14	118	199	428	324	196	89	1354	8.7	14.7	31.6	23.9	14.5	6.6
15	127	219	543	377	209	96	1570	8.1	13.9	34.6	24.0	13.3	6.1
16	135	237	487	352	202	95	1508	9.0	15.7	32.3	23.4	13.4	6.3

16			av	22-Apr-1990	17:27	ST1316	.FRQ	Amplitude				
Channel	Absolute Activity							Relative Activity				
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	96	133	186	145	143	106	810	11.8	16.4	23.0	17.9	17.7	13.1
2	113	156	221	173	179	132	972	11.6	16.0	22.7	17.8	18.4	13.5
3	69	114	171	124	109	80	668	10.4	17.1	25.6	18.5	16.4	12.0
4	69	115	173	135	139	99	730	9.4	15.8	23.7	18.5	19.1	13.5
5	93	148	224	175	159	116	914	10.1	16.2	24.5	19.1	17.4	12.7
6	88	152	233	187	165	134	960	9.1	15.9	24.3	19.5	17.2	14.0
7	197	224	297	191	193	146	1248	15.8	17.9	23.8	15.3	15.5	11.7
8	198	224	302	203	198	133	1258	15.8	17.8	24.0	16.1	15.8	10.6
9	134	203	309	209	204	125	1185	11.3	17.1	26.1	17.7	17.2	10.6
10	135	203	302	219	211	129	1198	11.3	17.0	25.2	18.2	17.6	10.7
11	129	189	288	223	179	105	1113	11.6	16.9	25.8	20.0	16.1	9.4
12	127	197	291	308	204	116	1244	10.2	15.8	23.4	24.8	16.4	9.4
13	124	179	270	225	174	101	1072	11.5	16.7	25.2	20.9	16.2	9.4
14	112	180	274	228	177	100	1072	10.5	16.8	25.6	21.3	16.5	9.3
15	134	186	274	231	180	100	1105	12.1	16.8	24.8	20.9	16.2	9.1
16	119	184	306	246	176	101	1132	10.5	16.3	27.0	21.7	15.6	8.9

17				av	22-Apr-1990	20:34	BY1117		.FRQ		Amplitude		
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	77	98	155	128	186	160	805	9.6	12.2	19.3	15.9	23.1	19.9
2	85	113	168	157	231	197	950	8.9	11.9	17.7	16.5	24.3	20.7
3	65	89	148	143	141	77	662	9.8	13.4	22.3	21.5	21.3	11.6
4	69	92	155	167	173	111	767	9.0	12.0	20.3	21.8	22.5	14.5
5	83	107	233	261	179	88	951	8.7	11.3	24.5	27.4	18.8	9.3
6	76	113	266	315	199	96	1065	7.1	10.6	25.0	29.5	18.7	9.0
7	101	120	199	165	233	241	1061	9.6	11.4	18.8	15.6	22.0	22.7
8	100	128	198	171	278	257	1133	8.8	11.3	17.5	15.1	24.6	22.7
9	92	130	213	189	256	185	1065	8.6	12.2	20.0	17.7	24.1	17.4
10	95	142	224	199	278	189	1128	8.4	12.6	19.9	17.7	24.6	16.8
11	93	142	280	253	233	123	1124	8.3	12.7	25.0	22.5	20.7	10.9
12	98	147	272	278	239	134	1166	8.4	12.6	23.3	23.8	20.5	11.4
13	105	146	321	329	234	107	1242	8.4	11.7	25.8	26.5	18.9	8.6
14	93	147	318	342	236	108	1243	7.5	11.8	25.6	27.5	18.9	8.7
15	94	132	340	441	239	111	1357	6.9	9.8	25.1	32.5	17.6	8.2
16	96	143	358	402	234	101	1335	7.2	10.7	26.8	30.1	17.5	7.6

17				av	22-Apr-1990	20:42	BY1217		.FRQ		Amplitude		
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	218	204	239	156	196	173	1186	18.4	17.2	20.2	13.2	16.5	14.6
2	166	162	212	161	263	208	1171	14.2	13.8	18.1	13.7	22.5	17.8
3	75	96	151	111	142	82	657	11.4	14.7	23.0	16.9	21.6	12.4
4	76	104	146	133	195	144	799	9.5	13.0	18.3	16.7	24.4	18.0
5	77	111	214	187	182	93	863	8.9	12.8	24.8	21.7	21.1	10.8
6	79	113	221	202	182	94	891	8.8	12.7	24.8	22.7	20.5	10.5
7	121	143	222	176	257	254	1173	10.3	12.2	18.9	15.0	21.9	21.6
8	134	141	226	175	304	258	1238	10.9	11.4	18.2	14.1	24.6	20.8
9	103	126	212	173	247	180	1040	9.9	12.1	20.4	16.6	23.7	17.3
10	98	135	221	173	282	183	1094	9.0	12.4	20.2	15.8	25.8	16.7
11	97	138	252	211	221	129	1049	9.2	13.2	24.0	20.2	21.1	12.3
12	93	147	258	215	223	127	1063	8.7	13.8	24.3	20.2	21.0	12.0
13	99	147	281	246	230	108	1111	8.9	13.2	25.3	22.2	20.7	9.7
14	98	145	264	237	211	105	1059	9.3	13.7	25.0	22.4	19.9	9.9
15	95	156	335	283	221	111	1201	7.9	13.0	27.9	23.6	18.4	9.2
16	103	140	285	252	214	107	1102	9.4	12.7	25.9	22.8	19.4	9.7

17				av	22-Apr-1990	20:49	BY1317		.FRQ		Amplitude		
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	106	118	165	127	211	192	919	11.5	12.9	18.0	13.8	22.9	20.9
2	101	121	174	158	237	227	1019	9.9	11.9	17.1	15.5	23.3	22.3
3	68	98	145	130	152	112	705	9.7	13.8	20.6	18.4	21.6	15.9
4	67	96	148	143	175	139	768	8.7	12.5	19.2	18.6	22.8	18.1
5	80	110	176	189	181	102	839	9.6	13.2	21.0	22.5	21.6	12.1
6	84	116	189	192	186	104	871	9.6	13.3	21.7	22.0	21.3	11.9
7	152	159	225	182	284	275	1277	11.9	12.4	17.6	14.3	22.2	21.5
8	152	165	233	191	287	252	1280	11.9	12.9	18.2	14.9	22.4	19.7
9	95	132	214	186	264	201	1093	8.7	12.1	19.6	17.1	24.2	18.4
10	108	141	216	193	261	202	1119	9.6	12.6	19.3	17.2	23.3	18.0
11	95	143	243	212	224	136	1054	9.1	13.6	23.0	20.1	21.3	12.9
12	100	139	235	218	222	141	1055	9.4	13.2	22.3	20.7	21.0	13.4
13	98	147	245	232	229	116	1067	9.2	13.7	22.9	21.8	21.5	10.9
14	96	143	234	208	216	114	1010	9.5	14.1	23.1	20.6	21.4	11.2
15	100	148	226	273	217	113	1077	9.3	13.7	21.0	25.4	20.1	10.5
16	96	135	223	251	192	105	1002	9.6	13.5	22.2	25.1	19.2	10.5

18							av 24-Apr-1990	13:29 BH1118	.FRQ	Amplitude			
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	199	206	192	131	157	129	1012	19.6	20.3	18.9	12.9	15.5	12.7
2	214	213	213	129	159	130	1058	20.2	20.2	20.1	12.2	15.1	12.3
3	81	101	106	106	233	188	815	9.9	12.3	13.0	13.0	28.6	23.1
4	77	96	109	102	208	193	786	9.8	12.2	13.9	13.0	26.5	24.5
5	80	101	129	118	187	133	748	10.7	13.6	17.2	15.8	24.9	17.8
6	79	101	133	119	189	145	765	10.3	13.2	17.4	15.6	24.7	18.9
7	320	406	348	169	231	248	1722	18.6	23.6	20.2	9.8	13.4	14.4
8	312	409	348	173	235	262	1740	17.9	23.5	20.0	9.9	13.5	15.1
9	156	198	202	133	184	150	1023	15.2	19.4	19.7	13.0	18.0	14.6
10	142	188	205	132	174	120	961	14.7	19.6	21.3	13.7	18.1	12.5
11	105	147	178	130	178	112	850	12.4	17.3	20.9	15.2	21.0	13.1
12	92	144	179	126	183	126	852	10.9	17.0	21.0	14.8	21.5	14.8
13	111	138	192	152	216	127	935	11.9	14.7	20.5	16.3	23.1	13.5
14	106	139	189	142	193	110	879	12.0	15.8	21.4	16.2	22.0	12.6
15	139	153	197	189	258	141	1078	12.9	14.2	18.3	17.5	23.9	13.1
16	137	156	191	172	244	135	1035	13.2	15.0	18.5	16.6	23.6	13.0

18							av 24-Apr-1990	13:38 BH1218	.FRQ	Amplitude			
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	214	229	238	149	176	136	1143	18.7	20.1	20.8	13.0	15.4	11.9
2	231	245	251	156	197	162	1242	18.6	19.8	20.2	12.6	15.8	13.1
3	81	95	111	115	292	224	919	8.8	10.3	12.1	12.5	31.8	24.4
4	82	100	118	113	257	264	934	8.8	10.7	12.6	12.1	27.5	28.3
5	82	118	144	113	203	163	824	10.0	14.4	17.5	13.7	24.6	19.8
6	72	100	134	97	179	148	730	9.8	13.6	18.3	13.3	24.6	20.3
7	382	639	600	258	275	265	2419	15.8	26.4	24.8	10.7	11.4	11.0
8	394	651	629	290	372	411	2746	14.3	23.7	22.9	10.6	13.6	15.0
9	163	217	239	147	210	172	1147	14.2	18.9	20.8	12.8	18.3	15.0
10	154	206	227	142	200	144	1073	14.3	19.2	21.2	13.3	18.6	13.4
11	102	143	187	128	180	131	870	11.8	16.4	21.4	14.7	20.6	15.1
12	98	139	188	125	206	172	927	10.5	15.0	20.2	13.5	22.2	18.5
13	102	143	193	126	187	123	874	11.6	16.4	22.0	14.4	21.4	14.1
14	100	130	187	112	169	108	804	12.4	16.2	23.2	13.9	21.0	13.4
15	103	171	259	179	201	154	1067	9.6	16.0	24.3	16.8	18.8	14.5
16	102	151	227	158	197	138	973	10.4	15.5	23.3	16.2	20.3	14.2

18							av 24-Apr-1990	13:44 BH1318	.FRQ	Amplitude			
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	103	124	147	141	201	212	929	11.1	13.4	15.8	15.2	21.7	22.8
2	97	136	165	151	244	264	1058	9.2	12.8	15.6	14.3	23.1	25.0
3	71	89	113	148	270	206	898	7.9	9.9	12.6	16.5	30.1	23.0
4	69	89	110	138	233	209	849	8.1	10.5	13.0	16.3	27.5	24.6
5	80	116	133	134	212	203	878	9.1	13.2	15.2	15.3	24.2	23.1
6	74	95	123	119	199	167	777	9.5	12.3	15.9	15.3	25.6	21.4
7	221	323	343	188	272	302	1650	13.4	19.6	20.8	11.4	16.5	18.3
8	213	323	350	202	310	325	1723	12.4	18.7	20.3	11.7	18.0	18.9
9	130	172	203	153	260	251	1170	11.1	14.7	17.4	13.1	22.2	21.5
10	115	165	204	155	258	233	1131	10.1	14.6	18.1	13.7	22.9	20.6
11	102	149	191	149	216	182	989	10.3	15.1	19.3	15.1	21.8	18.4
12	96	140	183	138	209	176	942	10.2	14.8	19.4	14.6	22.2	18.7
13	103	151	181	155	225	178	992	10.3	15.2	18.2	15.6	22.6	18.0
14	102	138	167	136	194	146	884	11.6	15.6	18.9	15.4	22.0	16.5
15	116	164	195	167	239	198	1080	10.7	15.2	18.1	15.5	22.1	18.4
16	106	142	173	158	228	185	993	10.7	14.3	17.4	15.9	23.0	18.6

19 av 03-May-1990 22:49 JD1119 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	83	110	142	127	189	93	743	11.1	14.8	19.1	17.1	25.5	12.5
2	89	122	157	138	207	98	812	11.0	15.1	19.4	17.0	25.5	12.1
3	57	97	123	113	181	110	681	8.4	14.3	18.0	16.6	26.6	16.1
4	73	118	158	141	193	85	768	9.5	15.3	20.6	18.3	25.2	11.0
5	70	111	155	170	165	92	764	9.1	14.6	20.3	22.3	21.6	12.1
6	86	127	191	223	194	104	925	9.3	13.8	20.6	24.1	20.9	11.2
7	116	138	163	135	216	173	940	12.3	14.7	17.3	14.3	23.0	18.4
8	129	152	186	140	218	187	1012	12.8	15.1	18.3	13.8	21.6	18.5
9	107	155	209	170	224	105	971	11.1	15.9	21.6	17.6	23.1	10.8
10	104	150	209	170	222	102	957	10.9	15.7	21.8	17.8	23.2	10.7
11	98	157	208	187	198	98	946	10.4	16.6	22.0	19.8	20.9	10.3
12	95	148	217	182	193	94	929	10.2	15.9	23.3	19.6	20.8	10.2
13	93	147	202	219	196	99	955	9.7	15.4	21.2	22.9	20.5	10.4
14	96	148	217	224	196	97	977	9.8	15.2	22.2	22.9	20.0	9.9
15	99	141	202	253	202	118	1015	9.8	13.8	19.9	24.9	19.9	11.6
16	116	157	225	259	208	126	1090	10.7	14.4	20.6	23.7	19.1	11.5

19 av 03-May-1990 22:57 JD1219 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	194	179	219	153	197	101	1042	18.6	17.2	21.0	14.7	18.9	9.7
2	200	200	229	166	243	129	1167	17.1	17.2	19.6	14.2	20.8	11.1
3	75	103	128	105	192	167	770	9.7	13.4	16.6	13.7	24.9	21.7
4	91	128	159	132	200	95	805	11.3	15.9	19.7	16.4	24.8	11.8
5	79	110	171	130	168	88	745	10.6	14.7	23.0	17.4	22.5	11.9
6	86	132	181	164	189	103	855	10.0	15.5	21.1	19.2	22.1	12.1
7	98	123	182	134	214	126	877	11.2	14.0	20.7	15.2	24.4	14.3
8	137	146	202	146	236	133	1000	13.7	14.6	20.2	14.6	23.6	13.3
9	117	160	225	166	222	111	1000	11.7	16.0	22.5	16.6	22.2	11.1
10	105	140	198	162	229	105	939	11.2	14.9	21.1	17.3	24.4	11.2
11	100	146	212	166	202	101	926	10.7	15.7	22.9	18.0	21.8	10.9
12	94	142	201	172	210	96	914	10.2	15.6	21.9	18.8	23.0	10.5
13	99	136	207	166	205	99	911	10.8	14.9	22.7	18.2	22.5	10.8
14	103	150	209	176	195	95	929	11.1	16.2	22.5	18.9	21.0	10.2
15	103	141	215	194	211	114	978	10.6	14.4	22.0	19.8	21.6	11.6
16	107	154	251	228	212	130	1081	9.9	14.2	23.2	21.1	19.6	12.0

19 av 03-May-1990 23:04 JD1319 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	90	115	167	142	200	123	837	10.7	13.8	19.9	17.0	23.8	14.7
2	92	122	191	152	209	123	888	10.3	13.7	21.5	17.1	23.6	13.8
3	58	101	133	122	230	207	851	6.9	11.8	15.6	14.3	27.1	24.3
4	73	118	162	135	238	145	871	8.4	13.6	18.6	15.5	27.3	16.6
5	74	123	163	122	185	133	801	9.2	15.4	20.4	15.2	23.2	16.7
6	86	138	189	157	209	140	919	9.4	15.0	20.6	17.1	22.7	15.2
7	205	249	248	162	222	136	1220	16.8	20.4	20.3	13.3	18.2	11.1
8	210	252	261	169	226	124	1242	16.9	20.3	21.0	13.6	18.2	10.0
9	113	181	234	172	223	129	1051	10.7	17.2	22.2	16.3	21.2	12.2
10	98	164	222	167	230	127	1008	9.7	16.2	22.1	16.6	22.8	12.6
11	99	172	242	168	207	124	1011	9.8	17.0	23.9	16.6	20.4	12.3
12	93	160	218	162	206	121	960	9.7	16.7	22.8	16.8	21.5	12.6
13	101	166	221	165	212	126	991	10.2	16.8	22.3	16.6	21.4	12.7
14	100	165	213	166	202	122	968	10.3	17.1	22.0	17.1	20.8	12.6
15	96	159	226	182	221	136	1021	9.4	15.6	22.2	17.9	21.6	13.3
16	101	172	264	201	235	166	1139	8.9	15.1	23.2	17.6	20.6	14.6

20				av	04-May-1990	06:35	NW1120	.FRQ	Amplitude				
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	131	146	208	181	254	137	1057	12.4	13.8	19.6	17.1	24.1	12.9
2	108	123	180	159	241	130	941	11.5	13.0	19.1	16.9	25.6	13.9
3	89	120	181	177	229	118	913	9.7	13.1	19.8	19.4	25.0	12.9
4	73	90	141	125	212	136	777	9.4	11.5	18.2	16.1	27.3	17.4
5	117	147	235	254	269	129	1150	10.1	12.8	20.4	22.1	23.4	11.2
6	86	109	198	186	209	143	932	9.2	11.7	21.3	19.9	22.5	15.4
7	221	251	246	205	322	256	1501	14.7	16.7	16.4	13.6	21.4	17.1
8	235	258	244	215	337	268	1556	15.1	16.6	15.7	13.8	21.7	17.2
9	142	170	271	222	340	159	1304	10.9	13.1	20.8	17.0	26.1	12.2
10	132	164	261	217	344	177	1295	10.2	12.7	20.1	16.8	26.5	13.7
11	123	164	279	237	294	126	1222	10.0	13.4	22.8	19.4	24.1	10.3
12	106	148	261	214	264	117	1111	9.6	13.3	23.5	19.3	23.8	10.5
13	135	178	288	276	300	128	1305	10.4	13.6	22.1	21.1	23.0	9.8
14	122	157	261	239	254	115	1148	10.6	13.7	22.7	20.8	22.1	10.1
15	153	178	267	362	305	147	1412	10.9	12.6	18.9	25.6	21.6	10.4
16	143	180	268	310	294	154	1349	10.6	13.4	19.9	23.0	21.8	11.4

20				av	04-May-1990	06:43	NW1220	.FRQ	Amplitude				
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	180	194	249	201	274	148	1246	14.4	15.6	20.0	16.2	22.0	11.9
2	192	184	237	195	266	152	1227	15.7	15.0	19.3	15.9	21.7	12.4
3	108	145	207	199	237	102	997	10.8	14.5	20.8	20.0	23.7	10.2
4	89	102	165	149	249	176	930	9.5	10.9	17.8	16.0	26.8	19.0
5	104	145	266	236	265	130	1146	9.1	12.6	23.2	20.6	23.1	11.4
6	90	125	231	171	207	184	1008	8.9	12.5	22.9	17.0	20.5	18.3
7	160	182	263	221	291	150	1268	12.6	14.4	20.7	17.4	23.0	11.9
8	196	204	305	243	326	183	1458	13.5	14.0	20.9	16.6	22.4	12.6
9	147	184	283	233	334	147	1328	11.1	13.9	21.3	17.6	25.2	11.0
10	145	181	305	267	352	148	1397	10.3	12.9	21.8	19.1	25.2	10.6
11	125	168	302	249	286	121	1251	10.0	13.4	24.1	19.9	22.9	9.7
12	115	156	268	235	268	115	1156	10.0	13.5	23.1	20.3	23.2	9.9
13	132	169	318	262	294	122	1297	10.2	13.1	24.5	20.2	22.7	9.4
14	130	165	273	228	270	108	1175	11.1	14.1	23.3	19.4	22.9	9.2
15	137	183	319	278	278	127	1321	10.3	13.8	24.1	21.0	21.0	9.6
16	143	185	307	255	274	122	1285	11.1	14.4	23.9	19.8	21.3	9.5

20				av	04-May-1990	06:50	NW1320	.FRQ	Amplitude				
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	145	153	226	209	293	194	1219	11.9	12.6	18.5	17.1	24.0	15.9
2	127	148	218	200	275	172	1141	11.2	12.9	19.1	17.5	24.1	15.1
3	114	127	214	207	264	160	1084	10.5	11.7	19.7	19.1	24.3	14.7
4	85	105	162	168	371	275	1165	7.3	9.0	13.9	14.4	31.8	23.6
5	124	159	256	225	307	216	1287	9.6	12.4	19.9	17.4	23.8	16.8
6	121	128	196	170	250	217	1082	11.2	11.9	18.2	15.7	23.1	20.0
7	212	239	305	245	331	200	1533	13.8	15.6	19.9	16.0	21.6	13.1
8	215	241	329	262	345	228	1620	13.3	14.9	20.3	16.2	21.3	14.1
9	152	182	277	242	358	194	1406	10.8	13.0	19.7	17.2	25.4	13.8
10	146	183	299	250	357	190	1424	10.2	12.8	21.0	17.5	25.0	13.3
11	133	167	284	244	297	170	1294	10.3	12.9	22.0	18.8	22.9	13.1
12	120	154	272	222	277	158	1202	10.0	12.8	22.6	18.4	23.0	13.1
13	140	174	300	252	304	170	1340	10.4	13.0	22.4	18.8	22.7	12.7
14	133	170	258	211	270	149	1191	11.1	14.3	21.7	17.7	22.7	12.5
15	150	186	284	253	278	171	1323	11.3	14.1	21.5	19.2	21.0	12.9
16	150	195	251	243	273	158	1269	11.8	15.4	19.8	19.2	21.5	12.4

21 av 06-May-1990 03:40 RD1121 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	84	112	130	134	132	79	672	12.5	16.7	19.4	19.9	19.7	11.8
2	91	115	136	145	160	100	747	12.2	15.4	18.2	19.4	21.5	13.3
3	66	82	102	132	106	58	545	12.1	14.9	18.8	24.1	19.4	10.7
4	75	98	112	116	122	75	599	12.5	16.4	18.7	19.4	20.4	12.6
5	76	89	130	179	161	72	707	10.7	12.6	18.4	25.3	22.8	10.1
6	64	94	134	159	141	69	660	9.7	14.2	20.2	24.0	21.3	10.5
7	110	137	165	153	170	147	883	12.5	15.5	18.7	17.4	19.3	16.7
8	115	136	166	159	190	203	969	11.8	14.0	17.1	16.4	19.6	20.9
9	106	137	184	210	192	102	931	11.4	14.7	19.8	22.5	20.6	10.9
10	107	140	179	209	196	105	935	11.4	15.0	19.1	22.3	20.9	11.3
11	91	118	164	258	170	84	885	10.2	13.3	18.6	29.1	19.2	9.5
12	88	123	179	238	182	89	899	9.8	13.7	19.9	26.5	20.2	9.9
13	97	124	169	201	175	83	849	11.4	14.6	19.9	23.7	20.6	9.8
14	94	124	175	186	170	80	830	11.3	14.9	21.1	22.4	20.5	9.7
15	103	120	171	264	202	84	945	10.9	12.7	18.1	27.9	21.4	8.9
16	107	137	210	377	232	93	1156	9.2	11.9	18.2	32.6	20.1	8.1

21 av 06-May-1990 03:47 RD1221 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	141	161	169	133	136	86	826	17.0	19.4	20.5	16.1	16.4	10.5
2	201	187	225	159	186	125	1083	18.6	17.2	20.8	14.7	17.2	11.6
3	70	94	113	94	104	69	544	12.9	17.4	20.7	17.2	19.1	12.7
4	95	111	144	113	162	159	784	12.2	14.2	18.3	14.4	20.7	20.3
5	78	101	152	129	150	77	687	11.4	14.8	22.1	18.7	21.8	11.1
6	83	112	164	133	144	81	717	11.6	15.6	22.9	18.5	20.0	11.3
7	159	205	219	164	168	112	1028	15.5	19.9	21.3	16.0	16.4	10.9
8	151	183	212	162	186	165	1059	14.2	17.3	20.0	15.3	17.6	15.6
9	115	156	202	201	190	101	965	11.9	16.2	20.9	20.8	19.7	10.4
10	120	150	201	194	193	101	958	12.5	15.7	21.0	20.2	20.1	10.5
11	103	132	181	227	167	83	892	11.5	14.8	20.2	25.4	18.7	9.3
12	106	132	185	185	161	81	850	12.4	15.6	21.7	21.7	19.0	9.6
13	108	136	184	156	171	81	835	12.9	16.2	22.1	18.6	20.4	9.7
14	107	132	193	156	165	80	833	12.9	15.9	23.1	18.7	19.8	9.6
15	95	128	191	167	188	96	864	10.9	14.8	22.1	19.3	21.7	11.2
16	107	161	357	242	209	113	1188	9.0	13.6	30.1	20.3	17.6	9.5

21 av 06-May-1990 03:55 RD1321 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	94	119	130	108	127	85	662	14.2	17.9	19.6	16.3	19.1	12.9
2	104	119	134	119	162	115	755	13.8	15.8	17.8	15.8	21.5	15.3
3	64	97	107	107	102	68	546	11.8	17.8	19.7	19.5	18.7	12.5
4	81	105	112	106	166	161	732	11.1	14.3	15.4	14.5	22.7	22.0
5	73	103	124	112	141	86	639	11.5	16.0	19.3	17.6	22.1	13.5
6	70	97	117	114	146	106	651	10.7	14.9	18.0	17.6	22.4	16.3
7	143	156	182	143	163	113	900	15.9	17.3	20.2	15.9	18.1	12.6
8	143	150	174	143	183	157	949	15.0	15.8	18.3	15.1	19.2	16.6
9	115	147	182	151	175	96	866	13.2	17.0	21.0	17.5	20.2	11.1
10	117	149	165	155	187	110	882	13.3	16.8	18.7	17.6	21.2	12.4
11	92	124	149	133	143	81	722	12.7	17.2	20.6	18.5	19.8	11.2
12	95	131	142	142	157	114	780	12.1	16.8	18.2	18.2	20.2	14.6
13	91	134	154	140	161	88	768	11.8	17.4	20.1	18.2	20.9	11.5
14	91	132	148	141	162	99	773	11.8	17.1	19.2	18.3	21.0	12.8
15	89	121	154	144	188	118	814	11.0	14.9	18.9	17.7	23.1	14.4
16	99	131	187	180	241	175	1012	9.8	12.9	18.5	17.8	23.8	17.3

22 av 15-May-1990 10:02 RD1122 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	113	144	196	146	183	119	902	12.6	16.0	21.8	16.2	20.3	13.2
2	113	144	194	135	178	115	880	12.8	16.4	22.1	15.4	20.2	13.1
3	88	122	189	128	192	169	887	9.9	13.7	21.3	14.4	21.6	19.0
4	79	119	156	109	197	136	796	9.9	14.9	19.6	13.7	24.7	17.1
5	99	150	238	186	193	123	989	10.0	15.2	24.0	18.8	19.5	12.5
6	94	134	200	175	176	98	877	10.7	15.3	22.8	19.9	20.0	11.2
7	129	153	205	141	191	120	938	13.7	16.3	21.8	15.0	20.3	12.8
8	129	158	222	149	203	136	997	13.0	15.8	22.3	15.0	20.4	13.6
9	125	169	258	181	217	126	1075	11.7	15.7	24.0	16.8	20.1	11.7
10	113	160	244	165	210	139	1032	11.0	15.5	23.7	16.0	20.3	13.5
11	121	168	271	191	202	116	1068	11.3	15.7	25.4	17.9	18.9	10.9
12	106	159	242	172	187	133	999	10.6	15.9	24.3	17.3	18.7	13.3
13	125	176	284	219	213	110	1126	11.1	15.6	25.2	19.4	18.9	9.7
14	129	172	264	221	210	109	1105	11.7	15.6	23.9	20.0	19.0	9.8
15	128	185	255	241	211	121	1141	11.2	16.2	22.4	21.1	18.5	10.6
16	129	182	240	261	201	112	1126	11.4	16.2	21.3	23.2	17.8	10.0

22 av 15-May-1990 10:10 RD1222 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	158	179	229	167	217	167	1117	14.1	16.1	20.5	14.9	19.5	14.9
2	188	181	217	157	210	162	1115	16.9	16.2	19.5	14.1	18.8	14.5
3	93	142	185	131	237	206	994	9.4	14.3	18.6	13.2	23.8	20.7
4	98	124	166	134	279	214	1015	9.6	12.3	16.3	13.2	27.5	21.0
5	96	160	268	180	242	192	1137	8.4	14.1	23.6	15.8	21.2	16.9
6	98	148	235	167	191	138	977	10.0	15.2	24.1	17.1	19.5	14.1
7	153	189	248	164	211	147	1112	13.8	17.0	22.3	14.7	19.0	13.2
8	179	217	256	165	225	160	1202	14.9	18.0	21.3	13.8	18.8	13.3
9	135	172	272	195	235	162	1170	11.5	14.7	23.2	16.7	20.1	13.8
10	135	170	241	172	225	172	1115	12.1	15.2	21.6	15.5	20.2	15.4
11	117	163	262	193	220	152	1107	10.6	14.7	23.7	17.4	19.9	13.7
12	117	155	232	164	196	161	1025	11.4	15.2	22.6	16.0	19.1	15.7
13	121	166	285	196	223	147	1140	10.6	14.6	25.0	17.2	19.6	12.9
14	127	177	274	185	208	138	1110	11.5	15.9	24.7	16.7	18.7	12.5
15	118	191	322	258	240	153	1282	9.2	14.9	25.1	20.1	18.8	11.9
16	122	206	302	248	226	148	1253	9.8	16.4	24.1	19.8	18.1	11.8

22 av 15-May-1990 10:19 RD1322 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	106	139	221	159	210	177	1012	10.5	13.7	21.8	15.7	20.8	17.5
2	84	135	196	142	200	173	929	9.0	14.5	21.1	15.3	21.5	18.6
3	82	133	206	133	319	267	1141	7.2	11.7	18.1	11.7	27.9	23.4
4	77	126	172	119	249	195	939	8.2	13.4	18.3	12.7	26.6	20.8
5	104	165	235	173	251	221	1149	9.0	14.3	20.4	15.1	21.9	19.2
6	91	144	212	153	200	168	968	9.4	14.9	21.9	15.8	20.7	17.4
7	166	187	259	183	220	172	1187	14.0	15.7	21.8	15.4	18.5	14.5
8	151	182	255	184	228	177	1177	12.8	15.5	21.7	15.6	19.4	15.0
9	131	178	280	195	232	183	1199	10.9	14.8	23.3	16.3	19.4	15.3
10	114	159	253	181	225	186	1119	10.2	14.3	22.6	16.2	20.1	16.6
11	115	171	265	201	222	173	1147	10.0	14.9	23.1	17.5	19.4	15.1
12	108	147	244	175	196	180	1050	10.2	14.0	23.3	16.7	18.6	17.2
13	111	173	270	208	240	175	1177	9.4	14.7	23.0	17.7	20.4	14.8
14	119	167	272	202	216	160	1136	10.5	14.7	24.0	17.7	19.0	14.0
15	112	191	294	209	246	181	1233	9.1	15.5	23.8	16.9	20.0	14.7
16	108	183	291	203	224	164	1174	9.2	15.6	24.8	17.3	19.1	14.0

23 av 15-May-1990 13:32 SB1123 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	84	110	181	198	208	188	969	8.7	11.4	18.6	20.4	21.5	19.4
2	76	110	184	221	217	193	1002	7.6	10.9	18.4	22.0	21.7	19.3
3	60	77	140	156	191	173	796	7.5	9.6	17.6	19.6	24.0	21.7
4	57	90	158	193	192	107	797	7.1	11.3	19.8	24.3	24.1	13.4
5	76	106	224	269	204	106	984	7.7	10.7	22.7	27.3	20.8	10.8
6	73	98	262	266	207	108	1014	7.2	9.6	25.9	26.3	20.4	10.6
7	86	119	211	230	233	152	1030	8.3	11.5	20.5	22.3	22.6	14.7
8	91	120	209	234	241	210	1104	8.2	10.9	19.0	21.2	21.8	19.0
9	92	135	270	268	259	170	1195	7.7	11.3	22.6	22.4	21.7	14.2
10	94	138	279	286	266	195	1257	7.4	11.0	22.2	22.8	21.2	15.5
11	93	142	306	311	259	145	1256	7.4	11.3	24.3	24.7	20.6	11.5
12	95	139	324	447	291	161	1457	6.5	9.6	22.2	30.7	20.0	11.0
13	88	127	324	374	251	119	1282	6.8	9.9	25.3	29.2	19.5	9.3
14	94	129	332	327	259	114	1256	7.5	10.2	26.5	26.1	20.6	9.1
15	101	126	295	374	236	137	1269	7.9	10.0	23.3	29.5	18.6	10.8
16	110	128	320	414	253	129	1354	8.2	9.4	23.6	30.6	18.7	9.5

23 av 15-May-1990 13:39 SB1223 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	167	153	204	165	199	201	1088	15.3	14.0	18.7	15.2	18.2	18.5
2	191	185	228	185	221	203	1212	15.8	15.2	18.8	15.2	18.2	16.7
3	73	88	134	110	166	145	717	10.2	12.3	18.7	15.4	23.2	20.2
4	82	107	164	146	171	102	771	10.7	13.8	21.3	18.9	22.1	13.2
5	75	101	204	170	178	97	826	9.1	12.3	24.7	20.5	21.5	11.8
6	62	104	238	181	179	92	857	7.3	12.1	27.8	21.1	20.9	10.8
7	117	145	212	181	203	142	1001	11.7	14.5	21.2	18.1	20.3	14.1
8	120	151	212	188	219	175	1065	11.3	14.2	19.9	17.7	20.6	16.4
9	112	141	235	205	234	166	1092	10.3	12.9	21.5	18.7	21.4	15.2
10	105	149	237	215	249	178	1133	9.2	13.1	20.9	19.0	22.0	15.7
11	98	141	260	211	211	130	1050	9.3	13.4	24.8	20.1	20.1	12.4
12	90	139	254	292	224	135	1135	7.9	12.3	22.4	25.7	19.7	11.9
13	89	125	269	241	209	114	1048	8.5	12.0	25.7	23.0	20.0	10.9
14	87	126	268	247	209	105	1042	8.3	12.1	25.7	23.7	20.0	10.1
15	93	116	240	183	211	120	962	9.6	12.0	25.0	19.0	21.9	12.4
16	88	118	230	196	209	110	951	9.3	12.4	24.2	20.6	22.0	11.6

23 av 15-May-1990 13:47 SB1323 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	105	111	163	177	202	163	920	11.4	12.1	17.7	19.2	21.9	17.7
2	100	117	170	183	214	164	947	10.5	12.3	17.9	19.3	22.6	17.3
3	65	81	135	163	247	221	913	7.1	8.9	14.8	17.9	27.1	24.2
4	64	90	153	167	206	119	797	8.0	11.2	19.1	20.9	25.8	14.9
5	77	102	182	154	171	94	779	9.9	13.1	23.4	19.7	21.9	12.0
6	74	96	168	154	178	105	776	9.5	12.4	21.6	19.9	23.0	13.6
7	168	191	225	192	223	127	1126	14.9	16.9	20.0	17.1	19.8	11.3
8	172	193	233	202	238	139	1176	14.6	16.4	19.8	17.2	20.2	11.8
9	111	137	232	237	247	159	1123	9.9	12.2	20.6	21.1	22.0	14.2
10	109	136	231	208	241	162	1088	10.0	12.5	21.3	19.1	22.2	14.9
11	97	135	250	216	208	121	1027	9.4	13.1	24.3	21.1	20.3	11.8
12	96	130	249	201	201	115	991	9.7	13.1	25.1	20.3	20.3	11.6
13	92	127	246	192	203	107	967	9.5	13.2	25.4	19.8	20.9	11.1
14	96	127	241	195	198	99	956	10.1	13.3	25.2	20.4	20.7	10.4
15	105	122	215	197	196	103	937	11.2	13.0	22.9	21.0	20.9	11.0
16	99	121	205	189	194	99	906	10.9	13.4	22.6	20.8	21.4	10.9

24					av	15-May-1990	17:15	IB1124		.FRQ			Amplitude
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	81	104	129	131	141	99	684	11.9	15.2	18.8	19.1	20.6	14.4
2	86	118	165	162	170	131	833	10.4	14.2	19.8	19.5	20.4	15.7
3	60	84	103	113	133	119	613	9.8	13.7	16.8	18.5	21.8	19.3
4	61	96	140	161	220	199	877	7.0	10.9	16.0	18.3	25.1	22.7
5	64	80	132	180	144	119	719	8.9	11.1	18.4	25.0	20.0	16.6
6	74	99	159	244	201	151	928	8.0	10.7	17.2	26.3	21.6	16.2
7	120	139	179	169	171	123	901	13.3	15.5	19.9	18.8	18.9	13.7
8	118	141	188	180	186	148	960	12.3	14.6	19.5	18.7	19.3	15.4
9	108	153	219	204	179	120	984	10.9	15.6	22.3	20.8	18.2	12.2
10	98	156	219	214	197	162	1046	9.4	14.9	21.0	20.4	18.8	15.5
11	91	139	198	241	175	112	956	9.5	14.5	20.7	25.2	18.3	11.7
12	79	136	206	253	170	126	969	8.2	14.0	21.2	26.1	17.5	13.0
13	99	135	204	281	174	111	1005	9.9	13.5	20.3	28.0	17.3	11.0
14	97	130	206	291	191	122	1037	9.4	12.5	19.9	28.1	18.4	11.7
15	86	105	178	362	212	140	1083	8.0	9.7	16.4	33.4	19.6	13.0
16	93	114	182	295	213	135	1032	9.0	11.1	17.6	28.6	20.7	13.1

24					av	15-May-1990	17:23	IB1224		.FRQ			Amplitude
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	148	166	190	146	166	131	949	15.6	17.5	20.0	15.4	17.5	13.8
2	171	183	211	178	220	171	1134	15.1	16.2	18.6	15.7	19.4	15.0
3	65	91	116	97	134	121	624	10.4	14.5	18.6	15.6	21.5	19.4
4	84	111	162	146	214	181	897	9.4	12.4	18.0	16.2	23.8	20.2
5	70	105	142	139	178	153	788	8.9	13.3	18.1	17.6	22.6	19.5
6	75	109	178	172	193	147	874	8.6	12.4	20.4	19.7	22.0	16.8
7	135	197	244	198	221	179	1174	11.5	16.7	20.8	16.9	18.8	15.2
8	150	182	219	195	240	197	1184	12.7	15.4	18.5	16.5	20.3	16.6
9	102	152	220	199	194	142	1009	10.1	15.0	21.8	19.7	19.2	14.1
10	123	164	221	199	213	165	1085	11.4	15.2	20.3	18.3	19.6	15.2
11	87	142	208	211	185	129	962	9.1	14.7	21.6	21.9	19.3	13.4
12	96	140	210	211	181	135	973	9.9	14.4	21.5	21.7	18.6	13.9
13	99	142	214	218	187	124	984	10.1	14.4	21.7	22.1	19.0	12.6
14	97	139	210	211	192	131	979	9.9	14.2	21.4	21.5	19.6	13.4
15	87	138	192	174	195	135	921	9.5	14.9	20.9	18.9	21.1	14.7
16	84	143	204	177	200	137	945	8.9	15.1	21.6	18.8	21.2	14.5

24					av	15-May-1990	17:30	IB1324		.FRQ			Amplitude
Channel	Absolute Activity							Relative Activity					
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	86	106	135	121	159	136	743	11.6	14.3	18.2	16.3	21.3	18.3
2	105	124	189	166	202	155	941	11.1	13.2	20.1	17.7	21.4	16.5
3	56	77	102	96	152	141	624	9.0	12.4	16.4	15.3	24.3	22.5
4	68	99	156	144	207	169	842	8.1	11.7	18.5	17.1	24.6	20.1
5	65	92	127	124	198	180	785	8.3	11.7	16.2	15.8	25.2	22.9
6	69	103	168	167	201	174	883	7.8	11.6	19.0	18.9	22.8	19.7
7	122	144	193	160	194	157	970	12.6	14.9	19.9	16.5	20.0	16.1
8	135	147	210	183	219	165	1058	12.8	13.9	19.8	17.3	20.7	15.6
9	113	156	229	185	192	145	1019	11.1	15.3	22.5	18.1	18.8	14.2
10	126	157	232	197	201	150	1061	11.8	14.7	21.8	18.5	18.9	14.1
11	98	139	208	184	171	134	935	10.5	14.9	22.3	19.7	18.3	14.4
12	100	131	202	191	182	139	945	10.6	13.9	21.4	20.2	19.2	14.7
13	96	134	196	182	179	134	921	10.4	14.5	21.3	19.8	19.5	14.6
14	93	127	195	180	176	129	899	10.4	14.1	21.6	20.0	19.5	14.3
15	81	122	174	175	198	162	912	8.8	13.4	19.1	19.2	21.7	17.7
16	74	117	177	178	190	152	888	8.3	13.2	20.0	20.0	21.4	17.1

25 av 08-Apr-1990 21:46 JH1125 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	89	113	123	106	157	94	681	13.1	16.7	18.0	15.5	23.0	13.7
2	88	120	137	114	177	100	743	11.9	16.1	18.4	15.3	23.8	14.5
3	56	79	91	109	138	77	551	10.2	14.3	16.6	19.9	25.0	14.0
4	70	91	109	115	164	86	637	11.0	14.4	17.2	18.1	25.8	13.6
5	63	85	122	158	162	91	681	9.2	12.5	17.9	23.2	23.8	13.4
6	71	95	135	184	171	93	748	9.5	12.7	18.0	24.5	22.8	12.5
7	169	247	232	133	190	169	1139	14.9	21.7	20.4	11.6	16.6	14.8
8	168	262	245	139	212	189	1216	13.8	21.6	20.2	11.4	17.5	15.5
9	101	142	172	146	221	129	910	11.1	15.6	18.9	16.0	24.3	14.1
10	102	138	166	136	205	123	870	11.7	15.8	19.1	15.6	23.6	14.2
11	82	120	166	160	191	105	823	10.0	14.5	20.2	19.4	23.2	12.7
12	86	122	160	146	187	98	799	10.7	15.3	20.0	18.2	23.5	12.3
13	80	116	177	203	203	96	875	9.1	13.3	20.2	23.2	23.2	11.0
14	87	115	171	181	196	92	842	10.3	13.6	20.3	21.5	23.3	10.9
15	95	114	164	249	203	112	938	10.2	12.2	17.5	26.6	21.7	12.0
16	96	116	153	245	184	92	886	10.9	13.1	17.3	27.6	20.8	10.4

25 av 08-Apr-1990 21:39 JH1225 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	110	110	135	108	158	96	718	15.4	15.4	18.8	15.0	22.0	13.4
2	121	126	148	132	206	129	863	14.0	14.6	17.2	15.3	23.9	14.9
3	60	69	92	90	132	93	535	11.2	13.0	17.1	16.7	24.6	17.4
4	77	93	108	111	205	127	721	10.8	12.8	15.0	15.4	28.4	17.6
5	65	82	124	101	158	92	623	10.4	13.1	20.0	16.3	25.4	14.8
6	78	97	148	131	182	103	739	10.5	13.2	20.0	17.7	24.6	13.9
7	102	112	139	107	186	144	790	13.0	14.1	17.6	13.6	23.5	18.3
8	115	119	149	122	197	154	857	13.5	13.9	17.4	14.2	23.1	18.0
9	103	115	158	129	202	111	818	12.6	14.1	19.3	15.7	24.7	13.6
10	101	114	153	130	204	111	813	12.4	14.0	18.8	16.0	25.1	13.7
11	92	114	161	138	187	112	805	11.4	14.2	20.0	17.2	23.2	13.9
12	87	111	156	133	199	108	794	10.9	14.0	19.7	16.7	25.1	13.6
13	87	114	178	142	206	104	831	10.5	13.8	21.4	17.1	24.8	12.5
14	93	115	174	129	200	97	808	11.5	14.2	21.5	16.0	24.8	11.9
15	88	120	173	130	178	96	785	11.2	15.3	22.0	16.6	22.7	12.2
16	90	130	188	137	169	89	804	11.2	16.2	23.4	17.0	21.0	11.1

25 av 08-Apr-1990 21:30 JH1325 .FRQ Amplitude

Channel	Absolute Activity D1	D2	TH	AL	B1	B2	TOT	Relative Activity D1	D2	TH	AL	B1	B2
1	75	87	108	96	154	88	607	12.4	14.3	17.7	15.8	25.3	14.5
2	93	102	126	114	183	105	723	12.9	14.1	17.5	15.7	25.3	14.6
3	52	68	90	88	144	82	524	10.0	13.0	17.1	16.8	27.5	15.6
4	69	89	109	102	178	99	647	10.6	13.7	16.9	15.8	27.6	15.3
5	61	80	114	91	148	87	581	10.4	13.8	19.7	15.7	25.4	15.0
6	76	98	129	118	174	93	687	11.1	14.2	18.7	17.1	25.3	13.6
7	106	116	130	108	176	130	766	13.8	15.1	17.0	14.1	23.0	16.9
8	117	128	143	121	205	178	891	13.1	14.3	16.0	13.6	23.0	20.0
9	100	121	153	124	193	112	802	12.5	15.0	19.0	15.4	24.0	14.0
10	99	124	153	124	190	108	798	12.4	15.6	19.2	15.5	23.8	13.5
11	83	109	154	119	179	106	752	11.1	14.6	20.5	15.9	23.9	14.1
12	86	115	157	125	177	100	761	11.3	15.2	20.7	16.5	23.3	13.2
13	81	114	165	123	196	100	779	10.4	14.7	21.1	15.8	25.1	12.9
14	90	118	158	126	191	94	777	11.6	15.2	20.3	16.2	24.6	12.1
15	91	111	138	122	177	94	733	12.4	15.1	18.8	16.7	24.1	12.9
16	94	120	155	135	169	88	761	12.3	15.8	20.4	17.7	22.2	11.5

26					av	09-Apr-1990	00:37 RS1126		.FRQ		Amplitude	
Channel	Absolute Activity							Relative Activity				
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	84	110	151	127	128	94	694	12.1	15.8	21.8	18.3	18.4	13.5
2	107	133	184	149	165	136	875	12.3	15.3	21.0	17.1	18.9	15.5
3	55	85	129	115	204	182	770	7.2	11.0	16.7	14.9	26.5	23.6
4	84	123	175	163	204	157	906	9.3	13.6	19.3	18.0	22.6	17.3
5	85	111	172	187	156	122	833	10.2	13.4	20.6	22.4	18.7	14.6
6	100	139	218	217	154	104	932	10.7	14.9	23.4	23.2	16.6	11.2
7	103	134	177	149	158	127	849	12.2	15.8	20.8	17.5	18.6	15.0
8	112	140	186	160	188	193	979	11.4	14.3	18.9	16.4	19.2	19.8
9	116	158	243	199	185	126	1028	11.3	15.3	23.6	19.4	18.0	12.3
10	119	156	235	182	190	140	1022	11.6	15.3	23.0	17.8	18.6	13.7
11	110	162	259	233	171	104	1038	10.6	15.6	24.9	22.4	16.5	10.0
12	107	156	258	283	176	104	1082	9.8	14.4	23.8	26.1	16.2	9.6
13	117	155	252	281	175	95	1075	10.9	14.5	23.4	26.2	16.3	8.8
14	116	155	260	282	172	97	1082	10.7	14.4	24.0	26.1	15.9	8.9
15	120	149	263	258	185	94	1068	11.2	14.0	24.6	24.1	17.3	8.8
16	123	145	271	306	190	103	1138	10.8	12.8	23.8	26.9	16.7	9.0

26					av	09-Apr-1990	00:44 RS1226		.FRQ		Amplitude	
Channel	Absolute Activity							Relative Activity				
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	138	163	198	134	153	136	922	15.0	17.6	21.5	14.5	16.6	14.8
2	167	195	234	157	204	177	1133	14.7	17.2	20.6	13.8	18.0	15.6
3	64	99	134	101	267	244	909	7.0	10.9	14.8	11.2	29.4	26.8
4	87	131	179	140	358	320	1216	7.2	10.8	14.8	11.5	29.5	26.3
5	76	128	198	155	179	163	899	8.5	14.2	22.0	17.2	19.9	18.1
6	99	144	238	173	171	139	963	10.3	14.9	24.7	18.0	17.7	14.4
7	237	343	375	169	189	153	1466	16.1	23.4	25.6	11.6	12.9	10.5
8	275	390	406	178	243	240	1732	15.9	22.5	23.4	10.3	14.0	13.9
9	128	188	287	179	204	150	1137	11.2	16.6	25.2	15.7	18.0	13.2
10	141	197	273	168	236	195	1210	11.6	16.3	22.6	13.9	19.5	16.1
11	110	169	291	210	172	100	1051	10.4	16.0	27.7	20.0	16.3	9.5
12	107	167	277	222	173	106	1053	10.2	15.8	26.3	21.1	16.5	10.1
13	112	165	271	220	169	96	1033	10.9	16.0	26.2	21.3	16.4	9.3
14	119	164	270	213	169	97	1031	11.5	15.9	26.2	20.7	16.4	9.4
15	110	162	240	193	172	98	974	11.2	16.6	24.6	19.8	17.7	10.1
16	118	162	241	204	176	103	1004	11.8	16.1	24.0	20.4	17.5	10.3

26					av	09-Apr-1990	00:51 RS1326		.FRQ		Amplitude	
Channel	Absolute Activity							Relative Activity				
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	77	104	164	137	141	112	735	10.5	14.2	22.3	18.6	19.2	15.3
2	101	138	203	160	182	137	921	11.0	15.0	22.0	17.4	19.7	14.8
3	59	92	130	114	135	100	628	9.4	14.6	20.7	18.1	21.4	15.8
4	81	117	173	173	290	209	1044	7.8	11.2	16.6	16.6	27.8	20.0
5	86	123	170	150	161	120	811	10.6	15.2	20.9	18.5	19.9	14.8
6	91	128	194	183	173	117	885	10.3	14.5	21.9	20.6	19.5	13.2
7	129	161	224	173	181	131	999	12.9	16.1	22.4	17.4	18.1	13.1
8	143	172	234	177	209	185	1120	12.8	15.4	20.9	15.8	18.7	16.5
9	112	160	291	236	201	144	1145	9.8	14.0	25.5	20.6	17.6	12.6
10	119	165	268	201	208	156	1116	10.6	14.8	24.0	18.0	18.6	14.0
11	113	163	297	263	176	111	1122	10.1	14.5	26.4	23.4	15.7	9.9
12	109	153	270	256	177	111	1075	10.1	14.2	25.1	23.8	16.5	10.3
13	114	164	253	223	172	104	1031	11.1	15.9	24.5	21.6	16.7	10.1
14	111	154	240	227	172	104	1008	11.0	15.2	23.8	22.5	17.1	10.3
15	100	161	213	184	170	104	932	10.7	17.3	22.9	19.8	18.2	11.2
16	106	156	220	199	171	106	960	11.1	16.3	22.9	20.8	17.8	11.1

27						av 18-Apr-1990	17:06 EB1127	.FRQ	Amplitude			
Channel	Absolute Activity							Relative Activity				
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	87	106	137	140	178	141	788	11.1	13.4	17.4	17.7	22.5	17.9
2	102	122	156	158	247	203	989	10.4	12.3	15.8	16.0	25.0	20.6
3	62	75	117	172	262	223	910	6.8	8.2	12.8	18.9	28.8	24.5
4	63	89	126	160	190	149	776	8.1	11.4	16.3	20.6	24.5	19.1
5	76	98	156	266	166	104	866	8.7	11.3	18.1	30.7	19.2	12.0
6	79	101	174	245	171	113	882	9.0	11.4	19.7	27.8	19.4	12.8
7	225	274	216	176	247	215	1352	16.6	20.3	15.9	13.0	18.3	15.9
8	231	287	237	188	291	226	1460	15.8	19.6	16.3	12.9	19.9	15.5
9	128	162	209	226	260	194	1180	10.8	13.8	17.8	19.2	22.0	16.4
10	120	163	219	229	283	225	1240	9.7	13.2	17.7	18.5	22.8	18.2
11	100	133	209	274	215	142	1073	9.4	12.4	19.4	25.5	20.0	13.2
12	98	133	204	313	203	132	1084	9.0	12.3	18.9	28.9	18.7	12.2
13	101	127	204	376	205	118	1131	8.9	11.2	18.0	33.2	18.1	10.4
14	103	132	211	344	195	119	1103	9.3	11.9	19.1	31.2	17.6	10.8
15	110	145	241	466	219	131	1312	8.4	11.1	18.4	35.5	16.7	10.0
16	119	142	246	380	225	133	1245	9.6	11.4	19.7	30.5	18.0	10.7

27						av 18-Apr-1990	17:16 EB1227	.FRQ	Amplitude			
Channel	Absolute Activity							Relative Activity				
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	229	219	248	174	175	146	1191	19.3	18.4	20.8	14.6	14.7	12.3
2	244	228	251	195	269	215	1403	17.4	16.3	17.9	13.9	19.2	15.3
3	84	104	138	155	251	189	920	9.1	11.3	15.0	16.8	27.2	20.6
4	109	122	168	165	250	199	1013	10.7	12.0	16.6	16.3	24.7	19.6
5	72	104	174	199	163	104	816	8.8	12.8	21.3	24.4	20.0	12.7
6	88	113	196	228	196	119	940	9.4	12.0	20.9	24.2	20.9	12.7
7	131	149	204	181	238	181	1083	12.1	13.7	18.8	16.7	21.9	16.7
8	148	162	213	193	306	226	1248	11.8	13.0	17.1	15.5	24.5	18.1
9	119	156	232	226	245	191	1169	10.2	13.3	19.8	19.4	20.9	16.3
10	123	164	229	206	282	222	1226	10.1	13.4	18.6	16.8	23.0	18.1
11	106	141	219	256	204	142	1068	9.9	13.2	20.5	24.0	19.1	13.3
12	114	134	216	281	217	129	1092	10.4	12.3	19.8	25.7	19.9	11.9
13	100	133	213	287	198	119	1050	9.5	12.7	20.3	27.3	18.8	11.3
14	113	138	219	290	217	122	1098	10.3	12.6	19.9	26.4	19.7	11.1
15	92	136	213	284	213	124	1060	8.7	12.8	20.1	26.7	20.0	11.7
16	112	154	261	306	247	153	1233	9.1	12.4	21.2	24.8	20.0	12.4

27						av 18-Apr-1990	17:24 EB1327	.FRQ	Amplitude			
Channel	Absolute Activity							Relative Activity				
	D1	D2	TH	AL	B1	B2	TOT	D1	D2	TH	AL	B1	B2
1	80	106	144	144	188	162	823	9.7	12.9	17.4	17.5	22.8	19.7
2	107	133	163	158	237	207	1005	10.6	13.3	16.2	15.7	23.6	20.6
3	62	82	133	179	286	218	960	6.4	8.6	13.9	18.7	29.8	22.7
4	69	96	136	174	229	183	887	7.8	10.8	15.3	19.6	25.9	20.6
5	70	106	159	175	186	142	838	8.4	12.6	19.0	20.9	22.1	17.0
6	82	114	172	201	187	136	891	9.2	12.8	19.3	22.5	20.9	15.3
7	175	208	230	184	259	201	1258	13.9	16.5	18.3	14.6	20.6	16.0
8	187	218	246	191	279	215	1337	14.0	16.3	18.4	14.3	20.9	16.1
9	124	165	219	201	257	217	1184	10.5	14.0	18.5	17.0	21.7	18.3
10	120	176	224	194	255	233	1201	10.0	14.6	18.6	16.1	21.2	19.4
11	99	140	210	207	204	162	1022	9.7	13.7	20.5	20.3	20.0	15.9
12	99	142	206	221	200	140	1009	9.9	14.1	20.4	21.9	19.8	13.9
13	95	131	205	206	196	132	966	9.9	13.6	21.2	21.3	20.3	13.7
14	103	138	205	218	196	128	989	10.5	13.9	20.7	22.1	19.8	13.0
15	97	143	217	229	212	130	1028	9.4	13.9	21.2	22.2	20.6	12.6
16	103	147	219	252	229	160	1111	9.3	13.3	19.8	22.7	20.6	14.4

VITA

Christopher Allen Mann was born in Syracuse, New York, October 16, 1964. With his father serving in the Air Force, his elementary education was spent in multiple schools accross the United States and Europe. In 1977 he moved to Knoxville, Tennessee where he attended Bearden High School. Immediately after graduation he entered Chattanooga State College for his first year.

In 1983 he entered the University of Tennessee, and graduated with honors in 1986. During the same year Mr. Mann entered the graduate program in experimental psychology at the University of Tennessee with a major in physiological psychology. Over the next four years he was employed at Saint Mary's Medical Center, Neurodiagnostic Department, while also employed for two years as Tennessee Psychiatry and Psychopharmacology Clinic. In December of 1990 he graduated with a Ph.D.