

PAT FLANAGAN

Neurophone

The Neurophone was granted U.S. Patent #3,393,279 after Pat Flanagan flew to the Patent Office in Washington with his patent counsel, and proved to the examiner that the device worked. For his development of the device, Pat received the Gold Plate Award in 1962, along with such scientists as Dr. Edward Teller, Nobel Prizewinner in Physics, Dr. Wendell M. Stanley of Berkeley, Nobel Prizewinner in Chemistry, Dr. William Mayo, etc. At that event, Pat also received a Gold Key to the City of San Diego from the Mayor, and many offers of college scholarships which he turned down because of his fear that college would ruin his creativity. He also had the honor of being included in the book Leaders in American Science, which was published by Who's Who in American Education, Inc.

The Neurophone was used extensively in his Man to Dolphin Navy Contract work when Pat was Vice-President in charge of research for Listening, Incorporated in Arlington, Mass. The Neurophone patent was eventually sold to Intelectron Corporation, New York City for use in one of their therapeutic hearing devices now called the Transdermal Hearing Aid.

Whiz Kid, Hands Down

The very young man above is standing on his head because he says it helps him think. It evidently does. Pat Flanagan, a 17-year-old inventor from Bellaire, Texas, is already nipping at the heels of the venerable 30- and 40-year-old scientists and inventors who built the remarkable structures seen on pages 54 to 65. Pat has just perfected a remarkable machine of his own which one day may help deaf people hear and blind people "see." It may also earn him a million dollars. Pat treats his imminent collision with success with equanimity, for he reckons—and who is to gain say him nowadays—that the generation which will take over from the Take-over Generation will find nothing is impossible.

Pat Flanagan is a unique and self-spurred teen-age boy who has forged his mind and body into the model of a mature and inquisitive scientist. At the same time he reflects the more standard teen-age model; he is the twist champion of Bellaire—a suburb of Houston—a moderate party-goer and girl-chaser, the holder of a private pilot's license, and a spectacular gymnast. Despite his ability to function in two worlds, Pat leaves no doubt which one he favors. "There are

far too many kids my age who are willing to just get along." Pat is confident in his ability to do a lot more than just get along.

His single-minded belief in his abilities began with a compelling dream he had when he was 8 years old. "In the dream I was told I had to learn all about physics and electronics," he says. "And it told me I should help people." Already an athletic boy able to do 300 push-ups a day, he thereupon set out to improve his mind. By the time he was 13 he was repairing television sets during summer vacations, trying to earn money to build an electronic laboratory in his attic.

Pat's restless imagination drove him to tireless sessions in this laboratory. To abet them he solicited a rare favor from his parents and his older brother Mike—the privilege to experiment there undisturbed. One weekend last October, Pat started the experiment which led to the development of his particular fantastic machine. Starting with a radio transmitter he had designed himself, he tried modulating its waves to see if he could induce a sensation of hearing in his nervous system without going through

the normal channels of hearing. He hooked his radio to a small transmitter which looked like an earmuff. After 34 hours of work, he stopped up his ears, put the earmuff to his head—and found he still could "hear."

"I ran downstairs to tell somebody—anybody. I woke my mom. She just rolled over and said to me, 'That's nice, Pat, but I'll listen to it in the morning.' " She did listen in the morning and a lot of very important people have been listening to Pat ever since.

Pat calls his device "the neurophone" and the process it operates by "neuroception." Essentially what it does, he thinks, is transmit electrical messages—identical to those sounds generate—through the body's nervous system direct to the brain. Hence he can place the neurophone's earmuff on someone's spine or solar plexus, plug up his subject's ears, and the person will still "hear." Obviously if the neurophone in fact does what it seems to do, Pat has come a long way toward short-circuiting the body's ordinary sensory processes and giving man unprecedented access to his brain. Other inventors—many with a lot more experience and facilities than Pat



In his attic laboratory, Pat Flanagan cradles an oscilloscope. Pat built it into a "missile detector," which won him first prize at a Houston science fair.

—have been seeking such a device for years, and Pat explains his success versus their failure as a product of his own vigorous one-man approach to science. "I believe research in the problem of electronic hearing has been limited because inventors haven't been able to use human subjects as guinea pigs. An animal can't tell you just what he heard or how clearly he heard it. But I was my own guinea pig and I wasn't restricted by the possible bad effects, and I got the secret."

There is some question as to just what Pat has got—even he has no firm knowledge of why his neurophone works—but no question whatever that somehow he has got onto something valuable. Several companies have expressed interest in buying the rights to the neurophone and one Corpus Christi firm has tentatively offered him a million dollars if the machine can be adapted to send visual images into the brains of blind people. Dr. William O. Davis of Stamford, Conn.'s Huyck Corporation, a research and development company which is also fascinated by the neurophone, says, "The ability to detect radio signals in the brain is a remarkable phenomenon. If we never learn more about Pat's invention, even if we never learn why it works, it certainly is a utilitarian breakthrough which could help a number of people." Davis, who used to run the Air Force's basic research program, adds, "It's important to realize that young Planagan had the necessary intuition to invent his neurophone. You make discoveries intuitively, in the same manner you would paint a picture or write a symphony."

Pat now wants to go on to college, but he is worried about letting his talent: "I seek the knowledge college will provide, but I never want to be just satisfied with what someone else has written and done." He hopes, as his skills increase, to probe other recesses of men's mind. "I believe some day the entire concept of medical practice will be changed by electronics," he says. "People will be treated electronically rather than with medicine. If God can make the earth and sky and the force that makes people and trees live, then inventing anything less than this should be relatively simple."

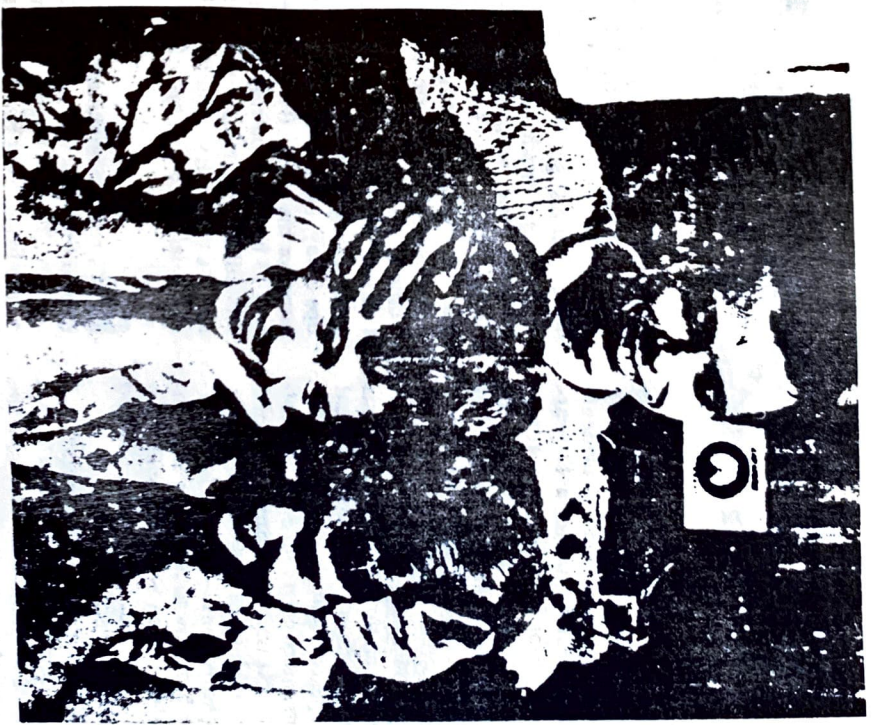
Statements like this one tend to prove a bit abrasive to Pat's classmates. "Pat's a wise guy. Plenty cocky, and sure of himself," one says, "but the bad part of it is he's just that much better at anything he sets his mind to do."

Pat claims this reaction does not bother him—"I want to be accepted, sure, but some people were cut out to go full tilt." Pat's hands and mind are always going full tilt of late. The books strewn across his cluttered attic laboratory range from Zen to Karate to electronic journals to *The Hidden Persuaders*. Lights glow from a wave-testing machine and he is working on a new way to tune TV sets.

"People think I've accomplished so much in life," he says. "They say what else can you do, and all that stuff. But I know where I'm going and I know what I have to do. When I die I want to leave behind something which will greatly affect and help everyone."

WILLIAM MOSSER

Trying out Pat's neurophone, two friends, Sharon Mayfield, 14, and Sue Rowe, 16, rattle as they "hear" sounds through its transmitters.





**ANNUAL
BANQUET OF THE GOLDEN PLATE
OF THE
ACADEMY OF ACHIEVEMENT**

**DECEMBER 29, 1962
OCEANHOUSE · SAN DIEGO, CALIFORNIA**

* PAT FLANAGAN

17-year-old inventor, Bellaire, Texas—"Pat is a unique and self-spurred teen-age boy who has forged his mind and body into the model of a mature and inquisitive scientist. He is already nipping at the heels of venerable 30- and 40-year-old scientists and inventors."

Pat is now a senior at Bellaire High, Bellaire, Tex. Has been prominent in the news for the past several months when his invention, the 'neurophone,' became known. His story appeared in Life magazine, Sept. 14 and he made an appearance on *I've Got a Secret*, Garry Moore's television program, Oct. 1.

He was born in Oklahoma City, Okla. and lived in several states before coming to Texas due to his father's job with Shell Oil Co. At age 11, he received his ham radio license. Later in Jr. Hi he originated and taught a ham club consisting of 15 members, all went on to become ham operators in their own right. He was class president in Jr. high and became a spectacular gymnast during that time.

Three months after moving to Texas, he entered a missile detector he designed in the Greater Houston Science Fair and walked away with 1st prize in Electronics and Grand Prize over the whole fair. The next year as a freshman, he won honorable mention in the Greater Houston Science fair with a transistorized muscle stimulator for outer space use. At 14, he got a full-time job 5 days week after school and all day Saturday as a radio and television repairman . . . working for the same shop for over 2½ years. While working, he bought a sports convertible and took up flying. Soloed on his 16th birthday and received his private pilot's license shortly after his 17th birthday. He's a member of



the Airplane Owner's and Pilot's Association and Sertoma International Club. He has paid for all these things himself from working. Also pays the insurance and upkeep on his car.

Besides being active at school in Bellaire Choral Group, he belongs to the Houston All City Chorus and attends the Methodist Church regularly.

He has one older brother, Mike who at 21 owns his business. Pat hopes to go on to college and become an electronic engineer, then go into research fulltime. His invention, the 'neurophone,' when perfected will be a boon to the deaf . . . allowing them to 'hear' by bypassing the ears, sending sound directly to the brain.

He's the son of Mr. and Mrs. Gil Flanagan.

*Saluted by Life magazine as one of the "Most Important Young Men and Women in the United States."

Achievement Honorees Feted Before Big Salute

One Hails S.D. Climate At Preliminary Dinner



FIRST MEETING—Egyptian journalist Kamal Raouf shakes hand of Pat Flanagan, 18, Texas inventor, at an Academy of Achievement dinner last

night. Others are Mrs. Raoul and Dr. Wendell M. Stanley of Berkeley, University of California Nobel Prize winner in chemistry.—Photos by Al Sund

Men and women of world wide achievement are becoming acquainted with San Diego and its people today in a series of preliminaries to the Banquet of the Golden Plate.

They will receive Golden Plate awards in the second annual Salute to Excellence, which will highlight a banquet in the Ocean House at 8 p.m. tomorrow.

Seventy-four awardees are expected, the sponsoring Academy of Achievement announced last night after six others had said they will be unable to attend.

'Good for Community'

The visitors include newcomers and some persons who have been familiar with the city or its scientists, researchers and other achievers.

"This is good for our community," George A. Scott, hospitality committee chairman, said last night at an informal banquet attended by 145 persons at the Mission Bay resort hotel.

"It is good for your lives to touch ours," Scott, who was master of ceremonies, told the visitors.

S.D. Weather Praised

When Scott introduced the celebrities, Harry W. Morgan of Macalester College, St. Paul, Minn., responded by praising San Diego's pleasant year-end weather.

CLASS OF SERVICE

This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (1-50)

SYMBOLS

DL = Day Letter
NL = Night Letter
LT = International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

HSAG055 (D CZA071) RX PD DUPLICATE OF TELEPHONED
TELEGRAM=CORPUS CHRISTI TEX APR 6 847A CST=

PAT FLANAGAN=
5102 LINDEN=

YOUR DEVELOPMENT MAY OFFER BREAK THROUGH FOR OUR
NEURO-VISION DEVELOPMENT OF TELEVISION FOR THE BLIND.
WE ARE PREPARED TO OFFER YOU ONE MILLION DOLLARS PLUS
CORPORATION STOCK IN BOTH DEVELOPMENTS FOR ALL RIGHTS
TO YOUR INVENTION IF IT PERFORMS AS REPORTED. WILL COME
TO HOUSTON TO WORK OUT DETAILS=

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE

This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (1-50)

SYMBOLS

DL = Day Letter
NL = Night Letter
LT = International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

E ODELL WOODS BUYERS COOP NATIONAL CORP
110 TARTLTON ST=

11501

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

Resume' on the Neurophone

The Neurophone is an electronic device intended for stimulating the nervous system with an electric field to produce auditory sensations. It consists of electronic circuitry into which audio signals from a microphone, recorder, etc. may be fed, and a pair of metallic output electrodes, each surrounded by insulating material. In normal use the electrodes are placed at either side of the subject's head.

Tests of the Neurophone on more than 1000 persons, including some totally deaf subjects, have produced intelligible auditory sensations in all cases.

Neurophonic effects can be produced with electrodes placed at many areas on the body, generally where nerves are concentrated close to the skin. The upper frequency limit of auditory perception is extended, while low frequency perception is more difficult until after some practice in listening.

A number of experiments have been carried out in an attempt to define the channel through which the Neurophonic effect operates.

A. The most significant of these was designed to detect mechanical coupling to the ears.

It is well known and easily observed that two tones close together in frequency and of approximately the same magnitude produce strong beats when added acoustically. This effect can be produced by summing the output of two different oscillators into a pair of headphones. It is also well known that applying the output of the oscillators separate to the two ears does not produce the strong beats heard when the sounds are acoustically added. If the Neurophone

mechanically stimulates the eardrum, then applying the output of one oscillator to the headphones, and the output of the other oscillator to the Neurophone should produce strong mechanical beats when the individual subjective amplitudes are about the same. The experiment consisted of first adjusting the two oscillators to very near the same frequency and listening to first the acoustical sum and second the binaural result. Then one tone was applied to the Neurophone and the other to both headphones. The loudness of each was then adjusted by alternate comparison until they were about the same. Then both Neurophone and headphones were listened to simultaneously.

Two tones were used, the first at 460 Hz mean frequency, with a beat of about 3 seconds per cycle. The second tone was chosen at 1 KHz, with about the same beat rate. Of five observers, none reported mechanical beats. The reported sound was comparable to that of the binaural test condition. It is concluded that the effect is not mechanical.

B. Measurements were made which indicate that less than 10^{-4} watts of electrical energy need be absorbed by the body to produce Neurophonic effects when the electrodes are placed at the subject's temples.

C. A special electrode has been designed to concentrate the Neurophone output energy in a small area. Use of this electrode at various spots on the head and neck revealed that Neurophonic effects could be produced only when the electrode was placed within approximately one inch of a major nerve trunk.

With the special electrode placed at the left or right temple, sound is subjectively heard to originate from the left or right hand directions. Using one of these electrodes at each temple, stereophonic effects have been produced.

D. Sensations of odor, taste, touch and vision have been produced Neurophonically, but detailed procedures and rigorous experimental verification have not been developed as of this writing.

G. P. Flanagan

D. W. Batteau

S. L. Moshier

Listening, Incorporated
Arlington, Mass.
July, 1966