

DISCLOSURE AND RECORD OF INVENTION

(This form is subject to the Privacy Act of 1974)

AUTHORITY: 5 USC Chapters 45 and 54, 10 USC 1124; and EO 9397.

PURPOSE: To document inventions for consideration of patenting by the Air Force.

ROUTINE USES: In the event the invention is selected for further processing toward patenting the personal information provided by the inventor is used to process a cash award. SSAN is used for positive identification.

DISCLOSURE IS VOLUNTARY: Failure to provide the requested information may delay or prevent granting of an award.

INSTRUCTIONS

Fill in each blank with the requested information or enter "NONE" as appropriate. If additional space is needed for any items, continue on blank sheets, identify the item and attach. This form must be signed and witnessed in the spaces provided on page 3. SUBMIT IN TRIPLICATE.

1. DESCRIPTIVE TITLE OF THE INVENTION

"A Method for Encoding & Transmitting Speech by Means of the Radio Frequency Hearing Phenomena

IDENTIFICATION OF INVENTOR(S)

The "RF (Radio Frequency) Hearing Effect" has been known since World War II. It was first noticed when individuals heard "clicks" when exposed to high power RADAR transmitter signals. Since WWII many studies and investigations on the effect have been made. It was generally concluded that the effect was due to a thermal interaction caused by RF heating in the head. A unique feature of the RF hearing effect is that the stimulation of the sense of hearing occurs without the use of any devices or equipment on behalf of the subject; the incident RF is converted to a subjective sound by the natural physiological system. It has been demonstrated that audio tones, when modulated on an RF carrier, can be perceived by human test subjects when exposed to such an RF signal. However, here-to-fore, attempts to encode speech on an RF carrier such that human subjects can intelligibly receive the speech message by means of the RF hearing effect have not been successful. The invention, provides a means of encoding speech on an RF carrier such that human subjects can intelligibly receive the speech message by means of the RF hearing effect. The invention is based on a thermal theory and model of the RF hearing effect. By means of the theoretical model it can be shown that clicks and tones can be perceived when encoded on an RF carrier by means of standard AM (Amplitude Modulation), which is consistent with previous experiments by others.

The model also shows that a severe distortion exist which does not impair the perception of clicks or tones but render speech unintelligible. Study and analysis of the modulation and distortion processes provided an insight and understanding of the speech intelligibility problems which eventually lead the inventors to recognize that a combination of filtering, biasing and nonlinear processing of the speech signal and the use of suppressed carrier AM modulation provides a means for the encoding of speech which will be intelligible to a human subject by means of the RF hearing effect.

USES OF THE INVENTION BY THE GOVERNMENT

The uses of the invention by the Government are:

- (a) A useful Psychological Warfare communications tool.
- (b) A distraction of delaying tactic for Active Denial Technology applications.
- (c) A "no-wires or receiving apparatus required" communications method for high acoustic noise environments, such as: aircraft, space missions, and hostage situations.
- (d) A means of providing or improving communications for people who are otherwise hearing disadvantaged deaf. This use has a potential for technology transfer.

<p>5. DATE (Invention was conceived) 27 October 1994</p>	<p>DATE (Invention was first disclosed to others) 1 November 1994</p>	<p>TO WHOM WAS INVENTION DISCLOSED? Steve Calico, Kyle Hendricks PL/WSR</p>
<p>6. DATE (The first drawing or sketch was made) 27 October 1994</p>	<p>DATE (Of the first written description) 1 November 1994</p>	<p>DATE (First model, prototype, preliminary synthesis, formulation, etc., was made) 27 October 1994</p>

7. HAS THE INVENTION BEEN TESTED?
 YES NO
 (If yes, state date of first test and describe the results)

The analysis of the invention explains the results of several tests.

8. HAS THE INVENTION BEEN USED?
 YES, EXPERIMENTALLY YES, ROUTINELY NO
 (If yes, state date and details of its use)

9. NAMES AND ADDRESSES OF ANY PERSON HAVING PERSONAL KNOWLEDGE OF ANY OF THE ABOVE FACTS IN 5, 6, 7, AND 8.

10. HAS THE INVENTION BEEN, OR WILL BE DISCLOSED IN ANY PRINTED PUBLICATION?
 YES NO
 (If yes, identify the publication and date)