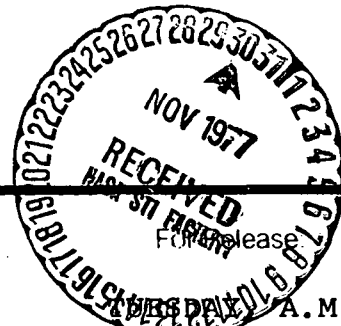


NASA News

National Aeronautics and
Space Administration

Washington, D.C. 20546
AC 202 755-8370



Ken Senstad
Headquarters, Washington, D.C.
(Phone: 202/755-8649)

NOV 29 1977
A.M.
November 29, 1977

Don Witten
Goddard Space Flight Center, Greenbelt, Md.
(Phone: 301/982-4955)

RELEASE NO: 77-238

SPACE RESEARCH LEADS TO HANDHELD X-RAY DEVICE

A concept fostered by a NASA scientist for studying X-ray sources in space has led to a handheld X-ray instrument which produces an instant image with a small source of radioactive material.

Powered by a single pen size battery, the prototype model of the rugged device exhibits high potential for screening and other uses in medicine, dentistry and areas of industry. The most obvious promise of the unique unit is for emergency and other field use where a quick fluoroscopic examination is desirable.

(NASA-News-Release-77-238) SPACE RESEARCH
LEADS TO HANDEELD X-RAY DEVICE (National
Aeronautics and Space Administration) 7 p.

N78-70144

1977

Unclas

00/35 53244

Potential applications of the portable instrument range from examination of a football player's possible bone injury on the field to detection of welding defects or gas leaks in pipes.

The device was developed by Dr. Lo I Yin, an X-ray researcher at NASA's Goddard Space Flight Center, Greenbelt, Md. He presented the first public details of the patented instrument Nov. 29 at a meeting of the American Nuclear Society in San Francisco, Calif.

The new device is called a Lixiscope (for Low Intensity X-ray Imaging Scope). It is based on a concept under study to research energy sources in space by converting their X-rays to visible images.

"The concept was not feasible until the declassification of an image intensifier developed by the Army's Night Vision Laboratory at Ft. Belvoir, Va.," Dr. Yin said.

"Any device developed for X-ray astronomy studies, where there is a scarcity of X-rays, should have technology of obvious value in medical fluoroscopy where there are many X-rays," Yin said.

Several research institutes in the dental and medical field are expected to participate in a cooperative effort to evaluate the Lixiscope. They include the National Institute of Dental Research (NIDR), Bethesda, Md., and Howard University's College of Dentistry, Washington, D.C. Others are the Cancer Research Center of Howard University's Medical School and Duke University Medical Center, Durham, N.C.

"The Lixiscope has a variety of potential applications, including patient screening, root canal analysis and possibly the monitoring of surgical procedures," said Dr. Richard Webber, Chief of NIDR's Clinical Investigations Branch.

Researchers at NIDR already have designed one configuration of the new device to be tested for dental application.

Other researchers at Howard University's Cancer Research Center would like to compare the Lixiscope with existing X-ray techniques for preliminary screening of soft tissue tumors.

"The device also shows promise for the detection of foreign bodies as well as for screening bone fractures," said Dr. Jack E. White, Head of Howard's Cancer Research Center.

According to White, use of the device for screening bone fractures could help cut down total X-ray dosages to the patient. Usual procedure now is to order X-ray images showing the limb or body from a variety of angles to insure that the proper aspect is covered.

The demonstration model of the Lixiscope was developed under direction of the Goddard Technology Utilization Office as part of the NASA Technology Utilization Program whose purpose is to identify and foster the transfer of promising aerospace technology for other uses.

Although the device is not on the market, it is estimated that production units could cost less than \$5,000 each based on existing component costs.

No new technology was required for the Lixiscope. In addition to the night vision image intensifier, it incorporates other off-the-shelf items including a radioactive source and an X-ray phosphor screen.

The pull of a trigger unshields the radioactive source, sending a low dosage of X-rays into the object being examined. The X-rays passing through the object are absorbed by the phosphor screen which converts them to visible light.

The night vision unit, which employs fiber optics, intensifies and channels the visible light to its viewing screen for image display.

Because of the high intensification capability of the unit, a small radioactive X-ray source of 10 to 20 millicuries can be used. Sources are interchangeable to facilitate use of the Lixiscope for a variety of applications.

Instant pictures of X-rayed objects can be made quickly with an attached camera, using a radioactive exposure a thousand times weaker than with a conventional X-ray machine. Prolonged examination of a patient with the Lixiscope obviously increases the dosage.

Co-authors of Dr. Yin's paper, entitled "A Portable, Low-Dose, X-ray Imaging Device," include Dr. Jacob Trombka of Goddard Center and Stephen M. Seltzer, a consultant in theoretical calculations from the National Bureau of Standards.

Photographs to illustrate this news release will be distributed without charge only to media representatives in the United States. They may be obtained by writing or phoning:

The Public Affairs Audio-Visual Office
Code FV/NASA Headquarters
Washington, D.C. 20546

Telephone No: 202/755-8366

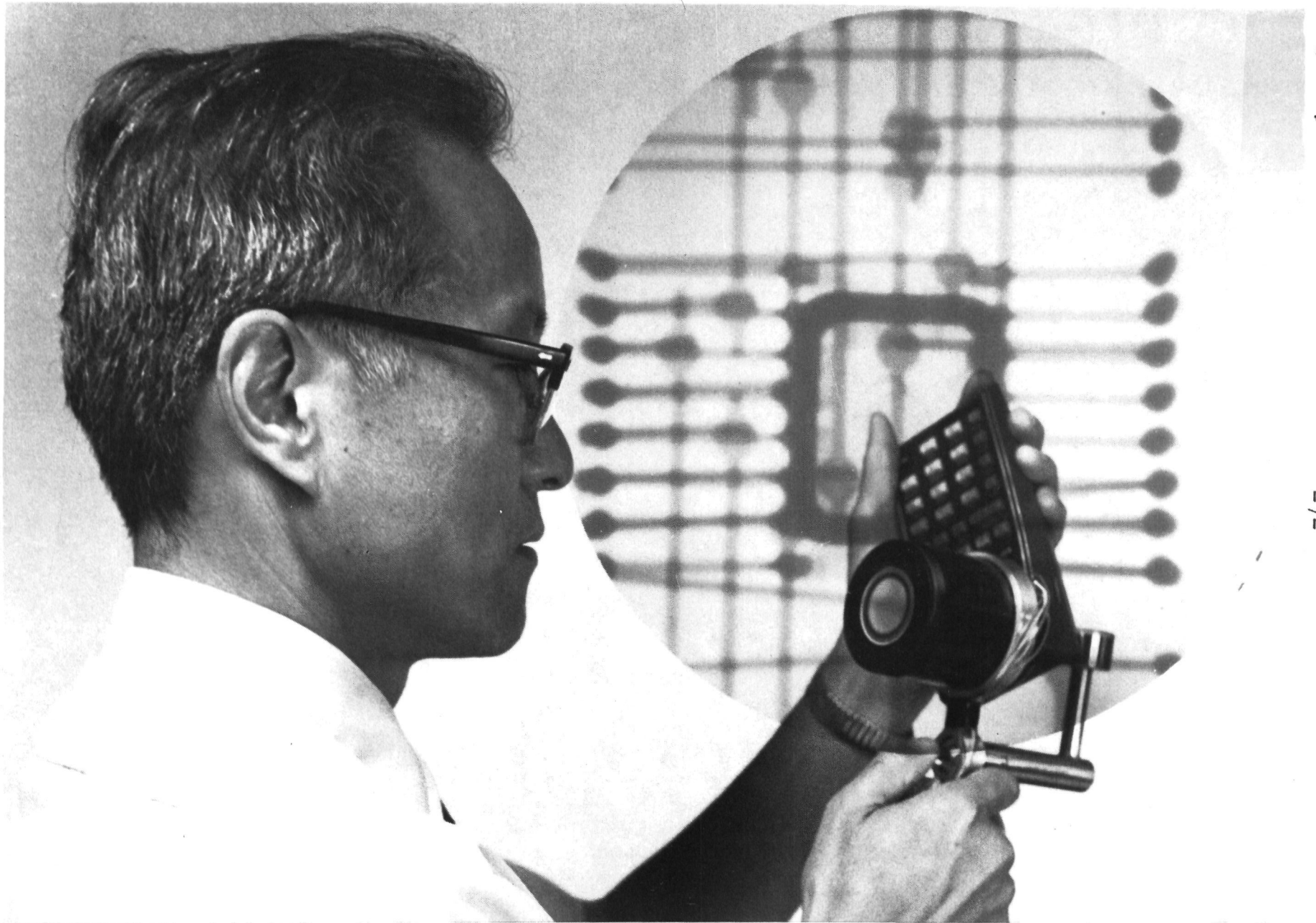
Photo Nos: 77-H-713
77-H-714



COMPACT X-RAY DEVICE -- Dr. Lo I Yin of NASA's Goddard Space Flight Center, Greenbelt, Md., examines a hand calculator with a demonstration model of his Lixiscope (Low Intensity X-ray Imaging Scope). Superimposed on the photo are images produced by the device. They include incisor teeth, integrated circuitry and the main joint of a forefinger.

NASA Photo: 77-H-713

-end-



-7-

VERSATILE X-RAY DEVICE -- Dr. Lo I Yin of NASA's Goddard Space Flight Center, Greenbelt, Md., examines a hand calculator with a demonstration model of his Lixiscope (Low Intensity X-ray Imaging Scope). Superimposed on the photo is an enlarged image of integrated circuitry in the background.

NASA Photo: 77-H-714