TECHNOLOGY

Reduce Lines Found On Television Tubes

➤ THE DARK horizontal lines on a television tube. now considered a natural limitation of picture size for easy viewing, can be reduced in size. Screens using a new method could be comfortably seen from about half the distance usually required.

Scientists at Westinghouse Research Laboratories in Pittsburgh developed the technique, known as "spot wobble," Francis T. Thompson reported to the Society of Motion Picture and Television Engineers meeting in Washington.

It is made possible by splitting in half one of the TV tube's cylindrical metal grids used to focus the electron beam into a tiny round spot. The electron beam is wobbled vertically as it makes its 525 horizontal traces across the tube's face. This slight up-and-down motion broadens the white lines which carry the picture information and narrows the distracting black lines between them.

The split-focusing grid still serves its regular function of sharply concentrating the electron beam on the screen. At the same time it allows application of a fluctuating voltage that wobbles the beam up and down about 15,000,000 times a second.

Mr. Thompson emphasized that "spot wobble" was still in experimental stages and its adoption on a commercial cable would probably require changes in the habits of television viewers. This is because, he said, the viewer associates distinct horizontal scanning lines with sharp focus and maximum picture detail, and this would not be true for tubes equipped with "spot wobble."

The grid-split method was developed by Dr. E. Atti and J. A. Hall of Westinghouse's electronic tube division, Elmira, N. Y. The line structure reduction method was developed by Mr. Thompson.

Science News Letter, June 1, 1957

TECHNOLOGY

First U. S. Reactor Goes Critical in Europe

➤ AMERICA's first "export" atomic reactor has gone "critical" at an exhibition in Amsterdam, The Netherlands.

More than 1,000,000 persons are expected to see the 10 kilowatt pool-type reactor, the first European nuclear reactor, designed and built by American industry, at the International Exhibition, "Het Atoom," or The Atom.

The first such atomic device to be completed under President Eisenhower's "Atoms for Peace" program, the reactor is supplied with 20% enriched uranium fuel from the United States.

After the exhibition, which closes in September, the reactor will be transferred to a Dutch technical university. It is a product of the American Machine and Foundry Company's AMF Atomics.

Science News Letter, June 1, 1957

"WOBBLING"—A method of line structure reduction in which the electron beam is "wobbled" gave the improved television picture shown at the right in these actual photographs of the same tube. The left picture is "normal."

AERONAUTICS

Blunt Noses for Missiles

See Front Cover

➤ INTERCONTINENTAL and intermediate range ballistic missiles will have blunt notes instead of the sleek, needle-like shape often pictured.

The blunt shape helps to beat the problem of excessive heat that is generated when the hypersonic missile re-enters the atmosphere.

For his discovery of this new design approach, made about five years ago but kept under secrecy wraps until now, H. Julian Allen was awarded the Distinguished Service Medal of the National Advisory Committee for Aeronautics. Mr. Allen is chief of the high-speed research division at NACA's Ames Aeronautical Laboratory, Moffett Field, Calif.

Solving the heat problem by rounding a missile's nose showed building an intercontinental weapon was possible. Scientists had not been sure of this before. The problem of how much weight is needed to get the required speed, and therefore cover the desired distance, still remained.

Mr. Allen began his studies with an analysis of the speed and deceleration of missiles entering the earth's atmosphere at high supersonic speeds. He found the force of gravity is negligible compared with the drag force of the air and that the missile's path during the period of intense heating is essentially a straight line.

The maximum slow-down of the missile, Mr. Allen's studies showed, is independent of its mass or size, depending only on the entry speed and flight-path angle.

His report, "A Study of the Motion and Aerodynamic Heating of Missiles Entering the Earth's Atmosphere at High Supersonic Speeds," was made with A. J. Eggers Jr., also of the Ames Aeronautical Laboratory.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows a shadowgraph picture made of a slightly curved cone with a blunt, rounded nose. It is seen moving in free flight at a Mach number of 8.3, or approximately 6,000 miles per hour at sea level. The heavy shock wave extending back from the nose contains a "very large amount of energy" which means heat is being kept from the model itself.

In 1952, when Mr. Allen's blunt-nose idea was first suggested, it was considered very radical. Although brought immediately to the attention of the military, it took about a year for the concept to become generally accepted.

Since then, long and intermediate ranges have included the missile designs for both blunt noses.

This shape throws 99% of the heat out into the atmosphere in the form of a shock wave, a shield of air ahead of the missile itself.

Highest speeds so far reported, and never officially denied, are above 8,000 miles an hour, about half that at which the ICBM is expected to plunge into the atmosphere.

Science News Letter, June 1, 1957