

# Special Applications of Photogrammetry Panel\*

## MODERATOR-

GOMER T. McNEIL

Photogrammetry, Inc., Silver Spring, Md.

## PARTICIPANTS

*Daniel F. Seacord, Jr.*

Edgerton, Germeshausen & Grier, Inc., Boston, Mass.

*Duane C. Brown*

R.C.A. Service Company, Patrick Air Force Base, Fla.

*E. S. Leonardo*

Goodyear Aircraft Corp., Arizona Div., Litchfield Park, Ariz.

*A. E. Gleit*

Philco Corporation, Western Development Laboratories, Palo Alto, Calif.

*Donn L. Ockert*

Photogrammetry, Inc., Silver Spring, Md.

*Joseph P. Sherby*

Stereophoto, Inc., Lansing, Mich.

*Martin Wohl*

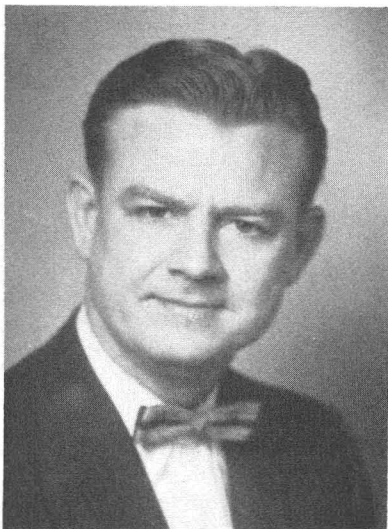
Massachusetts Institute of Technology, Cambridge, Mass.

*Stephen M. Sickle*

Chicago Aerial Surveys, Chicago, Ill.

## Introduction

GOMER T. MCNEIL, *Moderator*



GOMER T. MCNEIL

THE purpose of the panel is not to present highly technical papers at this time but instead and primarily:

- (1) to demonstrate the diversified applications of photogrammetry within science, engineering, and industry.
- (2) to gain a greater understanding of the requirements within science, engineering, and industry, in order that a problem can be more clearly stated and a solution more effectively performed, and
- (3) to assist in the establishment of photogrammetry as a universally recognized service tool within science, engineering, and industry.

I thank Professor Frederick J. Doyle of the Ohio State University for his interest in this panel and his recommendation of four participants now serving on the panel. Professor Doyle, as you know, is the United States Reporter for Commission V,

\* The papers in this Panel were presented at the Society's Annual Meeting, Hotel Shoreham, Washington, D. C., March 10, 1959.

Special Applications and Measurements, of the International Congress of Photogrammetry Meeting which is to be held in London during September 1960. We hope that this panel will be of some support to Professor Doyle in preparing his report on United States activities since the last Congress held at Stockholm in 1956.

Our participants hail from the Great Lakes, Cape Cod, Atlantic Missile Range, Pacific Missile Range, and other areas throughout our fine land. They represent large, medium, and small commercial organizations and one of our largest and renowned engineering institutions. Their subject matter is varied and they are a dedicated group.

## *Photography of Nuclear Detonation\**

DANIEL F. SEACORD, JR.,  
*Director of Analysis and Reports,*  
*Edgerton, Germeshausen & Grier, Inc.,*  
*160 Brookline Ave., Boston, Mass.*

**ABSTRACT:** *The use of photography as a measurement technique in the testing of nuclear weapons is discussed in connection with selectively edited weapons test films. The problems of photography in a nuclear detonation environment are pointed out. The utility of photography, and subsequent photogrammetric data reduction, is shown in the areas of shock wave propagation and fireball growth.*

### INTRODUCTION BEFORE START OF FILM:

ALL have seen pictures of movies of atomic explosions. Some of the pictures to be shown here have been released, and many are similar to released pictures. We bring these together to illustrate some things we are trying to measure, and as examples of the sort of work we are trying to do.

Much work we do photographically is in an effort to learn how *shock waves* are formed, how propagated, and what happens to them. The shock wave itself is invisible very quickly after it is separated from the fireball. There is a great interest in just what happens when it does separate; this is in the region of extremely strong shock.

We take pictures of shock by essentially a Schlieren technique. The wave is a very hot surface. While not hot enough to be seen, it is hot enough to refract light as it comes through. So if there is a source of light behind

the shock front, one can exactly determine the position of the shock wave.

To get a look at the shock wave, in many operations, people have been shooting off rocket trails. Pictures of these have been in the papers. With high-speed photography, as the shock wave progresses in front of the rocket trail, there can be seen a little ripple in the trail showing where it was and how it progressed.

Sometimes we have put up little puffs of smoke and these are physically moved by the shock after the wave passes. Also at times direct photography is possible just from the general light existing—reflected from the desert behind, reflected by the mountains, light from clouds overhead—which allows seeing almost the whole of the shock wave. All shock pictures are, of course, taken at high speed, to make possible seeing things that otherwise would go by too fast to be

\* The paper consists of introductory remarks and narrative discussion for the scientific film, "Photography of Nuclear Detonations." These were prepared by Dr. Lewis Fussell, Jr., Director of Research for Edgerton, Germeshausen & Grier, Inc. and were read by Mr. Seacord at the 25th Annual Meeting of the Society, Hotel Shoreham, Washington, D. C., March 10, 1959. This paper is a part of the panel on Special Applications of Photogrammetry.