NATIONAL BUREAU OF STANDARDS REPORT

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NBS REPORT

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Development, Testing, and Evaluation of
Visual Landing Aids

Consolidated Progress Report

to the

Airborne Equipment Division
Bureau of Aeronautics
Department of the Navy

For the Period
October 1 to December 31, 1954

for
Bureau of Aeronautics Projects

TED No. NBS-AE-10002
TED No. NBS-AE-10006
TED No. NBS-AE-10008
TED No. NBS-AE-10011

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

Development, Testing, and Evaluation of
Visual Landing Aids

October 1 to December 31, 1954

I. REPORTS ISSUED

Report No.	
21P-11/54.	Photometric Tests of a Model Light for Night Field Carrier Landing Practice.
21P-12/54	Photometric, Life, and Thermal Shock Tests of Ten Approach Light Lamps.
21P-18c/53	Qualification Tests of Seven TEE and Three Fused Connectors.
3789 (21P-16/54)	Photometric Tests of 36 Retroreflective Samples.
3741	Development, Testing, and Evaluation of Visual Landing Aids, Consolidated Progress Report for the Period July 1 to September 30, 1954.

II. TED No. NBS-AE-10002. GENERAL RESEARCH, LABORATORY AND CONSULTATION SERVICES IN CONNECTION WITH SPECIALIZED LIGHTING PROBLEMS, VISIBILITY AND FOG MODIFICATION

a. Visibility Meters and Slant Visibility

Transmissometers: Assistance to the Aerology Section in the technical phases of their transmissometer procurement program has continued. A two-day provisioning conference at the plant of the contractor was attended. The editing and revising of the transmissometer instruction manual to include changes in circuitry and procedure made since the manual was originally issued has been completed and the manual is now ready for rerunning.

Circuit diagrams of the instruments and auxiliary instruments designed and constructed at the Bureau have been completed in final form.

Slant Visibility Meter: The electrical controls of the slant visibility meter have been designed, installed, and tested. Several modifications of the receiver circuit recommended by the Weather Bureau have been incorporated into the equipment. Considerable difficulty has been encountered with a high noise level in the receiver. The primary source

of this noise was traced to an intermittently defective capacitor. Defective cabling and connections in the receiver as received from the manufacturer were also sources of noise. After these were corrected, there was still, on occasion, somewhat more noise than was desired. This was traced to radio-frequency pickup from a local T-V station. When this noise was eliminated by suitable bypassing, it was possible to complete the tests of sensitivity and of the noise produced by the scanning mechanism. These tests indicate that the operation of the receiver is satisfactory.

d. Night Field Carrier Landing Practice Lights

A report describing photometric tests of a model light for night field carrier landing practice and incorporating the results of these tests and of field tests made at NATC to determine the optimum intensity into a specification has been released. (NBS Test Report 21P-11/54). This completes the development work on this task.

e. General Laboratory and Consultive Services

Several conferences have been held with engineers of the contractor and of the Bureau of Aeronautics. An early model of the preproduction detector was demonstrated at one of these conferences. The preproduction set has been shipped to the Bureau for test. Tests will be expedited since there is urgent need for this instrument.

Characteristics of Retroreflectors: A report describing the method of test and giving the results of specific intensity measurements of 36 colorless retroreflectors, representative of all types produced in this country, has been released (NBS Report No. 3789). A report giving the specific intensity measurements of 21 colored retroreflectors is being prepared.

Connectors: Test results of seven TEE and three fused connectors have been reported in NBS Test Report 21P-18c/53.

III. TED NO. NBS-AE-10006. DEVELOPMENT OF AN AIRFIELD LIGHTING INTENSITY CONTROL SYSTEM.

No time was devoted to this task during this period.

IV. TED NO. NBS-AE-10008. DEVELOPMENT AND TEST OF SEALED-REFLECTOR APPROACH-LIGHT LAMPS.

Preparation of a report and a specification covering this work has been continued. The results of tests of ten approach-light lamps given in NBS Test Report 21P-12/54 complete the laboratory measurements for this task.

V. TED NO. NBS-AE-10011. FIELD SERVICE OPERATIONS

a. Airfield Lighting

Approach Beacons: Additional flight test data have been obtained. The pilot comments continue to indicate general satisfaction with the flash duration and frequency and that the system is very easy to interpret by pilots unfamiliar with the system. The beacons on two occasions provided needed assistance to visiting pilots who were having difficulty in orienting themselves with the runway. The elevation of the beams of beacons has been increased to provide better vertical coverage. Threshold lights of higher intensity have been installed. Eighteen-inch course lights were obtained from the CAA for this purpose. Some programmed flight testing is now required in order to explore fully the possibilities and performance of these units.

c. Research on Visibility Measurements and Visibility Meters

Transmissometers: The touchdown area transmissometer was relocated because of the possibility of interference with the new ILS glidepath transmitter. The baseline was extended to 750 feet during the move.

Equivalent Intensity of Flashing Lights ("Strobeacon") and Groups of Lights (Slopeline fixtures).: During recent tests in fogs emphasis was placed upon obtaining equivalent intensity data of the "Strobeacon" and a 6- and 10-light slopeline unit. The fogs were of densities which permitted the obtaining of data which filled the gaps in the previous data. A report giving the results of the tests on the slopeline unit has been drafted and is being edited. A report describing the tests of the "Strobeacon" is being prepared.

d. Electrical Engineering.

Maintenance Manual: The step-by-step trouble-shooting procedure for airfield series lighting systems has been completed and edited. A discussion of the variations in the operation of different regulators has been prepared and other material to supplement the step-by-step procedure is being prepared. A description of the proposed trouble-shooting manual was presented at the October meeting of the Lighting and Marking Panel.

General

During much of this quarter and of the last quarter, there have been two vacancies in the field. One of these vacancies has been filled and the other is in the process of being filled.

The recent earthquakes in Northern California caused no damage to any of the facilities of the operation.