

Transportable Processing Laboratory for Tactical Photography

WHILE THE FIGHTING was still raging in Korea, models of the Signal Corps Transportable Laboratory Darkroom AN/TFQ-7 were introduced to the soldier-photographer by New Equipment Introductory Teams from the Fort Monmouth Development Detachment. After state-side testing in training maneuvers and field exercises, this new aid for photo units engaged in tactical photography was ready for the real test under the severe forward-area conditions that were encountered in Korea.

The AN/TFQ-7 was developed to provide photographic equipment for use with combat units. It is an essential item necessary in the processing of tactical or "close-support" photography, intended as one means of providing the combat unit commander with tactical intelligence of terrain features, concentrations, roads, bridges, mine field patterns, material dumps and other subjects necessary to assist in evaluating the military situation.

At the close of World War II, it was recognized that no suitable field processing equipment existed for Corps or Division use. Accordingly, by action of the Signal Corps Technical Committee, the classification of the AN/TFQ-7 was approved as standard in August of 1945. Emphasis on winterization of Signal

Corps Equipment and the Korean situation resulted in redesign of the original model and procurement of a limited number of models for extended test.

In order to serve in a tactical situation, a photo lab must provide facilities for a supply of water and power, mobility, and adequate shelter and equipment for volume production. The whole problem of the supply and distribution of water and temperature control of solutions is a basic

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consideration in the design of the AN/TFQ-7 and a number of the features incorporated in this compact laboratory represent important improvements over existing methods. Water may be pumped into the laboratory's system through a hose extending to a local source, such as stream, lake, or well. A turbine-type pump, strainer, filter, flow indicator, 50 gallon storage tank, and suitable pipes and valves distribute water to the sinks and the water heater. The

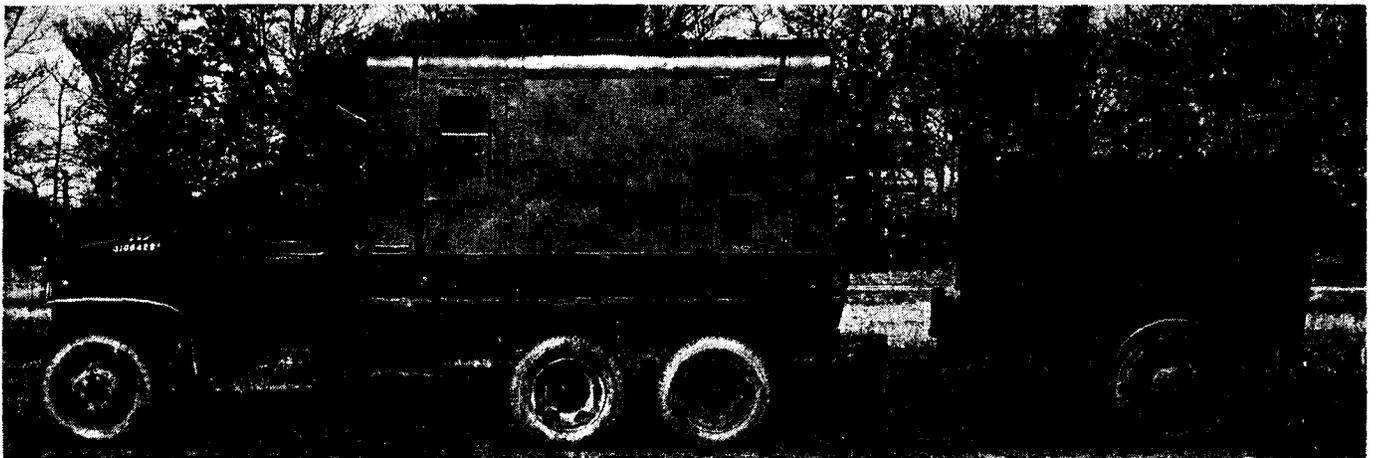
water heater provides the hot water required for chemical mixing. A separate system of heating and refrigeration is provided to maintain a flow of temperature controlled water in the film processing sink and the double-bottom trays in the print processing sink.

The standard practice of film and print washing makes a heavy demand on a water supply and even economical procedures take a quart of water for each 8" x 10" negative or print processed. When water must be carried from a QM supply area in five-gallon cans or by long hauls in water trailers, the technician may be forced to restrict water use below a satisfactory minimum. A temporary forward-area lab must always contend with this handicap; however, it has been minimized in the AN/TFQ-7 by the incorporation of three independent methods of avoiding a heavy use of water: stabilization processing,¹ re-use of contaminated water by means of ion-exchange purification,² and water-resistant papers. The required chemicals for stabilization processing have been procured in kit form and authorized as an expendable

¹Stabilization Processing by Steven Levinos & Willard C. Burner, *Photographic Engineering* Vol. 2, No. 3, 1951.

²Ion Exchange and the Reclamation of Photographic Wash Water by Steven Levinos, *Photographic Engineering*, Vol. 3, No. 1, July 1950.

Transportable Laboratory Darkroom AN/TFQ-7 mounted on 2½-ton truck and trailer, including power unit PE-95 and a winterized shelter.



item to this darkroom. By the use of this process in combination with water-resistant printing papers, all washing is completely eliminated, time is saved, and properly fixed prints may be delivered very quickly.

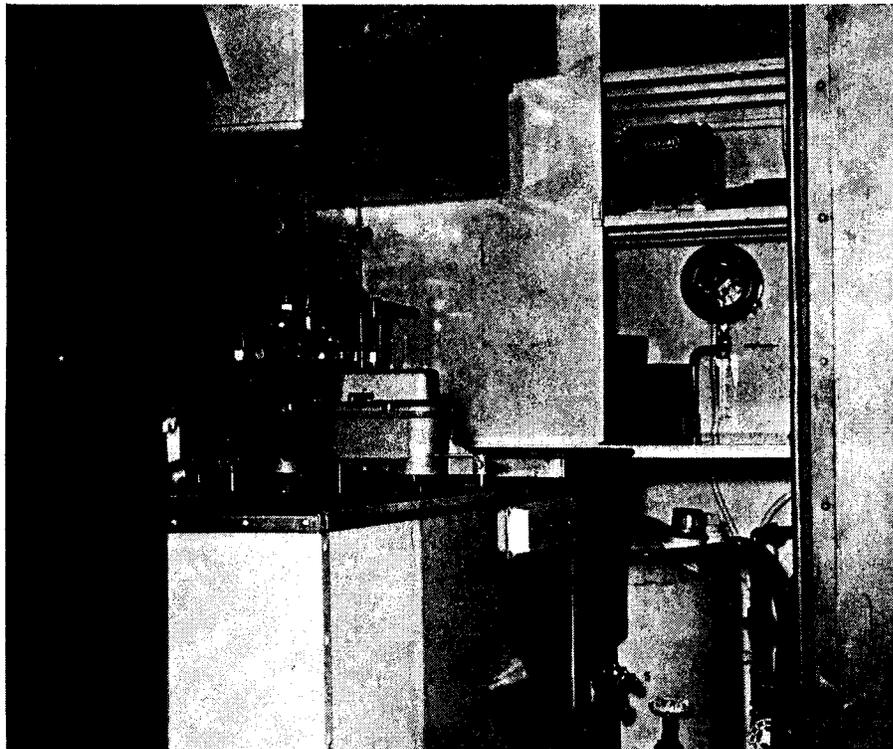
Ion-Exchange Water Conditioner PH-644()/UF is believed to be the first of its kind in a portable type unit. It purifies wash water for re-use by pumping the drain water from the print washing sink through a set of cans filled with ion-exchange resins. A Solu-bridge control indicates whether satisfactory purification has resulted by measuring the electrical conductivity of the water leaving the resin cans. The use of water-resistant papers and standard hypo and wash procedures safely reduces washing time from 1/2 hour to four minutes and permits rapid drying in air. Early experience with these innovations has been very encouraging.

Power is as great a problem in forward-area photo operations as is water supply and is a subject for continuous major investigation. At the present, power for the laboratory is supplied by a 10 KW trailer-mounted gasoline engine driven generator which includes battery powered pre-heater assembly installed on the power unit and a trailer mounted shelter.

Components of the laboratory are housed in a conventional insulated shelter made of wood, plywood, fiberglass, and steel (Shelter S-71/G) divided into three light-tight sections. A wall mounted air conditioning unit and a gasoline burning heater of 60,000 BTU rating provide for the comfort of four technicians over a wide range of environmental conditions. A standard 2 1/2 ton cargo truck provides the necessary mobility. The large number of standard darkroom items which have been fitted into this small working space is very surprising. Most of these components are more familiar to darkroom workers under their commercial descriptions and a partial listing serves to indicate the volume and variety of work which this small laboratory is prepared to handle.

A film processing sink which can handle 4" x 5" hangers in racks or a Morse roll film developing tank PH-683/U, a chemical mixing sink, and a print washing sink were specially built to fit the available space. The remaining components are either standard military and/or commercial items found in most darkrooms. Among these are:

- 2 Daylight developing tanks for 5 1/2 foot lengths of 35 mm. film.
- 1 Stainless steel multiple purpose daylight developing tank for



Interior view of film process room of the transportable laboratory darkroom.

either 4 rolls or 35 mm. film or 2 rolls of 120 film.

- 1 Printer PH-680, capable of contact printing from negative sizes up to and including 9" x 9" with provision for print dodging by the use of 39 independently controlled lamps.
- 1 Printer PH-639/TF (the versatile Omega D-II), equipped with three lenses, matched condenser units, and negative carriers to enlarge negatives in 35 mm., 70 mm., and 5 1/4 inch roll films and 4" x 5" sheet film.
- 2 High capacity film drying units: The film drier PH-685/U which handles roll film up to 9 3/8 inches and a cabinet using-forced heated air to dry both roll and sheet film.
- 1 Small power-driven rotary drum suitable for drying both glossy and matte prints.

Miscellaneous components including timers, print straightener, safelights, paper cutter, trays, hangers, paper safes, etc. round out a complete high capacity darkroom. To expedite the neat captioning of large numbers of prints, a gelatin type duplicator and portable typewriter are also included.

Two relatively recent commercial developments which add to the utility and efficiency of the AN/TFQ-7 in the performance of its mission have been included, each peculiarly suited to the requirements of compactness and portability over rough terrain.

The first of these is the use of polyethylene non-breakable storage containers for stock solutions of photographic chemicals. These have been found inert to all standard solutions used in black and white processing and their use has eliminated the nuisance and contamination resulting from breakage in handling and transit. Second of the innovations is the use of Varigam Photographic Papers. This variable contrast printing paper is being introduced in standard and water resistant bases in 8" x 10" and 10" x 10" cut sizes. The necessary filters and safelights are authorized for use and it is anticipated that acceptance of this feature may reduce to one-eighth or less the number of different papers presently required.

Organization of these complete photographic facilities into such a compact space has made for unavoidable complexities which have been recognized as requiring special training of the operating personnel. Accordingly, the Signal Corps Photographic School at Fort Monmouth has one unit of the AN/TFQ-7 for the training of students and the preparation of special operational guidance. The use of the AN/TFQ-7, operated by properly trained technicians, is expected to add another technological advantage to the many already contributing to the strength and effectiveness of our combat forces.
