

# AIR TERMINALS FOR

## TRANS-ATLANTIC SERVICES

Port Washington, N. Y.

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● Trans-Atlantic experimental survey flying, by Pan American Airways, Imperial Airways, Lufthansa and Air France, has necessitated the construction and maintenance of specialized bases to accommodate large four-engined flying boats. Coupled with the regularly-scheduled flights between New York or Baltimore and Bermuda, the plan of operations entails handling of passengers, a phase that will be expanded when daily schedules go into operation between the United States and Bermuda, and when passenger service across the ocean to Europe is put into effect in the near future.

Since early spring Pan American Airways has been successfully utilizing the wide and protected expanses of Manhasset Bay at Port Washington, Long Island, as its Atlantic Division's western base for the Atlantic and Bermuda service. A newer base is being constructed at Baltimore, Md., and from this point Pan American and Imperial will operate during the coming winter season.

The physical layout at Port Washington is characteristic of Pan American Airways' principal bases in general layout, organization and method of operation, although the facilities there are available to the three foreign airlines.

A modern steel hangar 330 ft. x 130 ft. is being utilized for overhaul and storage. It is large enough to accommodate three

of the new Boeing flying boats, each of which will have a span of 152 ft. The administration building, adjoining the hangar, houses Atlantic Division personnel and facilities for handling passengers. As indicated on the accompanying drawing, space in this building has been allotted to: (A)—Flight control, (B)—Meteorology, (C)—Communications, (D)—Operations manager, (E)—Division engineer, (F)—Division manager, (Col. C. C. Cone), (G)—Traffic, (H)—Showers for personnel, (I)—Steward's room, and (J)—Stock-room.

In addition, there is a large concrete hangar-apron, a ramp, a floating walkway and float for loading passengers, and three mooring buoys anchored about 265 ft. from the float.

For maintenance and overhaul purposes, Pan American has adequate facilities, equipment and personnel to handle not only the Bermuda service (which now operates four round-trips a week) but also the experimental survey flights over the Atlantic Ocean.

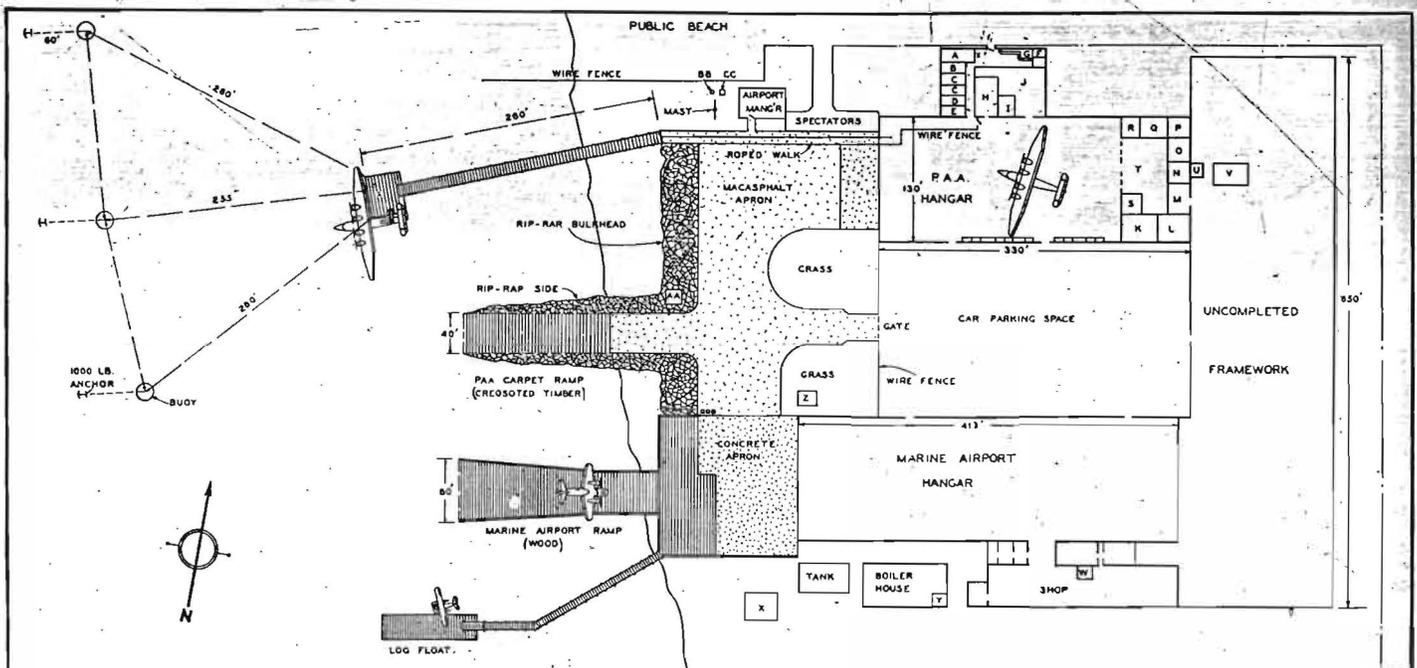
While the greater portion of the overhaul work is done at Port Washington, major engine overhauls (after 425-450 hrs.) are done at the company's principal repair base in Miami, the engines being shipped there for that purpose by express. Four spare engines are also kept on hand at Port Washington, and in the

large well-supplied stock room there is available complete equipment for the fabrication of many replacement parts and special equipment.

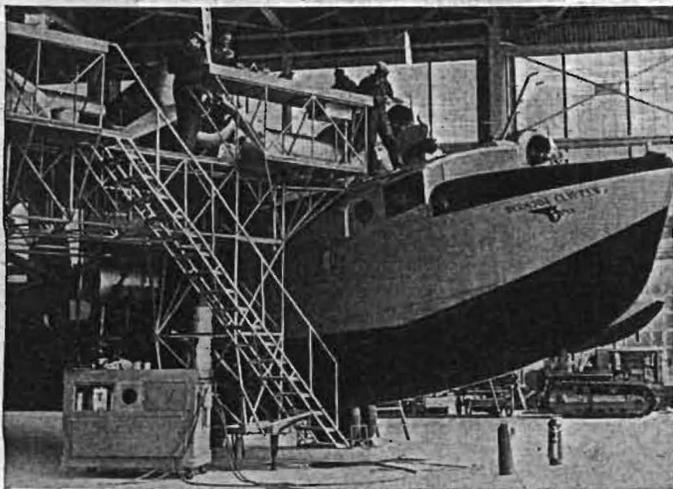
Pan American Airways' needs are peculiar unto itself, and therefore the company has found it practicable to make a large portion of its shop and special equipment. For example, the engine work stands, originally developed at Alameda for the Pacific service, are actually portable work shops. They are four-wheeled structures of welded square-section steel tube, having work benches at engine-level, and, in the upper platform (reached by a stairway with canvas treads), cut-outs into which fit the propeller blades. A piping system is provided for compressed air equipment, a cylindrical tank containing Kiso, a refined kerosene cleaning fluid which is pressure-sprayed on the engines. This fluid runs into pans under the engines and drains into drums hung in the framework of the stand. Inverted jacks at each wheel allow the stand to be rolled into place against the leading edge of the wing on either side of the hull; the jacks may be extended, thus taking the load off the wheels and preventing the stand from rolling out of position.

Rather than adhere to specified overhaul periods, Pan American keeps its aircraft in condition by the "continuous maintenance" process. This procedure, divided into three categories known as "overnight," "short" and "long" services, covers items requiring service or inspection at the periods specified.

When a flying boat is brought into the hangar for servicing, it is first inspected by the chief inspector, who reports his findings in detail to the shop foreman. The foreman (S) departmentalizes the work  
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General arrangement of Pan American Airways' facilities at Port Washington, Long Island, New York



*The substantial and efficient nature of the portable workstands containing workshop facilities, is typical of PAA's maintenance equipment*

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required. Each item to be serviced is assigned to one workman whose job is not finished until it has again been inspected and approved. The individual working on the particular item is required to sign his name on a report relating to that item, certifying to its condition. This work may fall to the lot of upholstery (L), welding (O), woodworking (N), instrument shop (Q,R), propeller shop (K) or some other department.

The woodworking department makes shop work benches and is responsible for woodwork maintenance on the planes; the welding department fabricates the portable engine work stands, and attends to all welding operations. The upholstery shop does all re-upholstering, maintains upholstery, and makes, applies and keeps in repair the fabric sides for the specially-designed loading ramps that fit over the sides of the hull.

The instrument shop is equipped to handle adjustments and repair work on the many complex units being used in the Atlantic survey and Bermuda service flights. Complete in itself, the paint shop boasts a special unit, i.e., a portable paint stand with a formed metal tray top and fitted with air hoses, paint guns, nozzles, etc., as well as storage space for paint.

In checking or general overhauling, engine cowlings are usually removed first. To facilitate handling of these units and to prevent interchanging, a special table mounted on wheels and divided into four compartments is used; this table permits moving all four cowls to the back of the hangar (T) where tools for working on them are at hand.

In a separate building behind the main hangar (V), is the sand-blasting department where cowling, fittings and other metal parts are cleaned. Air compressors and tanks for operation of paint spray, cleaning fluid spray and sand blasting equipment is located in a small shed (U) behind the hangar.

Only minor radio repairs and adjustments are made at Port Washington, any major work, or the construction of new sets, being delegated to the Miami base.

Other units, noted on the accompanying diagram are: Bonded warehouse (W), Radio shack (X), Local public relations department (Y), Pump house (Z), Gasoline pit (AA), Rain gauge (BB), and Thermometer housing (CC).

#### Handling Aircraft

A precise technique has been developed for the safe and efficient handling of the big flying boats on land or when they are

not operating under their own power. After landing, engines are cut as soon as the mooring line is picked up. From then on, responsibility for maneuvering the plane passes from the captain to the chief of the beaching crew. Ships ride at their anchorages from a line at the bow; another line is then attached to a stern fitting, passed through a block and tackle on the floating walkway to the loading float and then to a winch on a tractor which draws the plane to the float, tail first, using the forward mooring to hold the bow in position. The plane is fended off from the float by the beaching crew, the tractor's operations being directed from the float by hand and whistle signals.

After its passengers and baggage are unloaded, the plane is released from its mooring to the float and drawn to the matted ramp, at which time the detachable beaching gear is fitted at each side of the hull at the wing struts and at the stern of the hull. The tractor then pulls the plane up a 7.5° slope to the concrete apron, hitches directly to the swiveling tail wheel, and then draws the plane into the hangar.

When putting a plane into the water, the tractor backs up, allowing the ship to roll down the ramp by gravity bow first. A man walks alongside each forward wheel carrying a wheel chock which can hold the plane on the incline if the cable should part. Each beaching gear axle is fitted with a welded channel steel member capable of supporting the plane, even after a short drop, should a tire fail. The beaching gear is quickly detached and removed just as soon as the plane is waterborne.

Passenger handling procedure has been developed with due regard to efficiency and dispatch. When a passenger enters the waiting room his baggage is weighed and his ticket checked; he then proceeds to a designated roped-off lane at the head of the walkway of the loading float where the plane is waiting. After the engines have been started, the airport manager sounds a bell once—signal for the crew to go aboard en masse. When the captain is satisfied that everything is ready, he telephones his approval from the float to the airport manager or airport clerk who then sounds a bell twice—signal for the passengers to go aboard. As soon as passengers are loaded, and ship's papers are put aboard, engines are revved-up full momentarily, as a check, while the ship is secured by a cable from a tail fitting to a cleat anchored on shore. When the captain signals that all is in readiness, the beaching crew chief pulls a cord releasing the tail cable, and the airplane is ready for the take-off.

Disembarking passengers go through the same governmental formalities required of steamship passengers. Customs, Public Health, Immigration, and Depart-

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*An aerial view showing the arrangement of Pan American Airways' first trans-Atlantic base located at Port Washington, Long Island*

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ment of Agriculture officials inspect the plane and baggage, and check entry requirements of passengers. Procedure has been so worked out that the time required for passengers to leave the airplane, comply with customs formalities, and get into the bus for New York requires only about twenty minutes.

#### Other Facilities at Port Washington

One of the most important departments at the Pan American's temporary service base at Port Washington is Meteorology which not only prepares daily weather forecasts for the Bermuda service, but also the phenomenally accurate forecasts used by PAA as well as the British and German crews engaged in experimental flying of the Atlantic. Forecasting is based on the polar front system—the system which enabled Pan American meteorologists to predict almost to the minute (as a matter of record, to within three minutes for the first three Atlantic crossings, and to the minute for the fourth) the required flying time for Capt. Harold E. Gray in the Sikorsky S-42B flying between Botwood, N. F., and Foynes, Ireland.

Meteorology is a division of the Com-

munications Department, the superintendent (at Port Washington) of which is W. Turner Jarboe, who did much of the radio work aboard the Pan American Clipper which pioneered the Pacific route. Communications keeps in constant touch with all Pan American planes flying in the Atlantic Division, and also serves Imperial Airways planes in the Bermuda and Atlantic services as well as Lufthansa, and (soon) Air France, in the Atlantic survey flights. While in flight, Pan American captains report to Port Washington every half hour, giving position, altitude, speed, weather, wind, and other essential data.

#### Baltimore Base

With the approach of the winter season, Pan American is putting into service its other temporary Atlantic base at Baltimore, Md., where a fine airport and sea-plane base adjoining Logan Field is under construction. The city of Baltimore is sponsoring the work as a PWA project, construction details being supervised by C. B. Cornell, construction engineer for the city; Lieut. L. M. Rawlins, managing engineer; and E. S. Deakne, PWA residential engineering inspector.

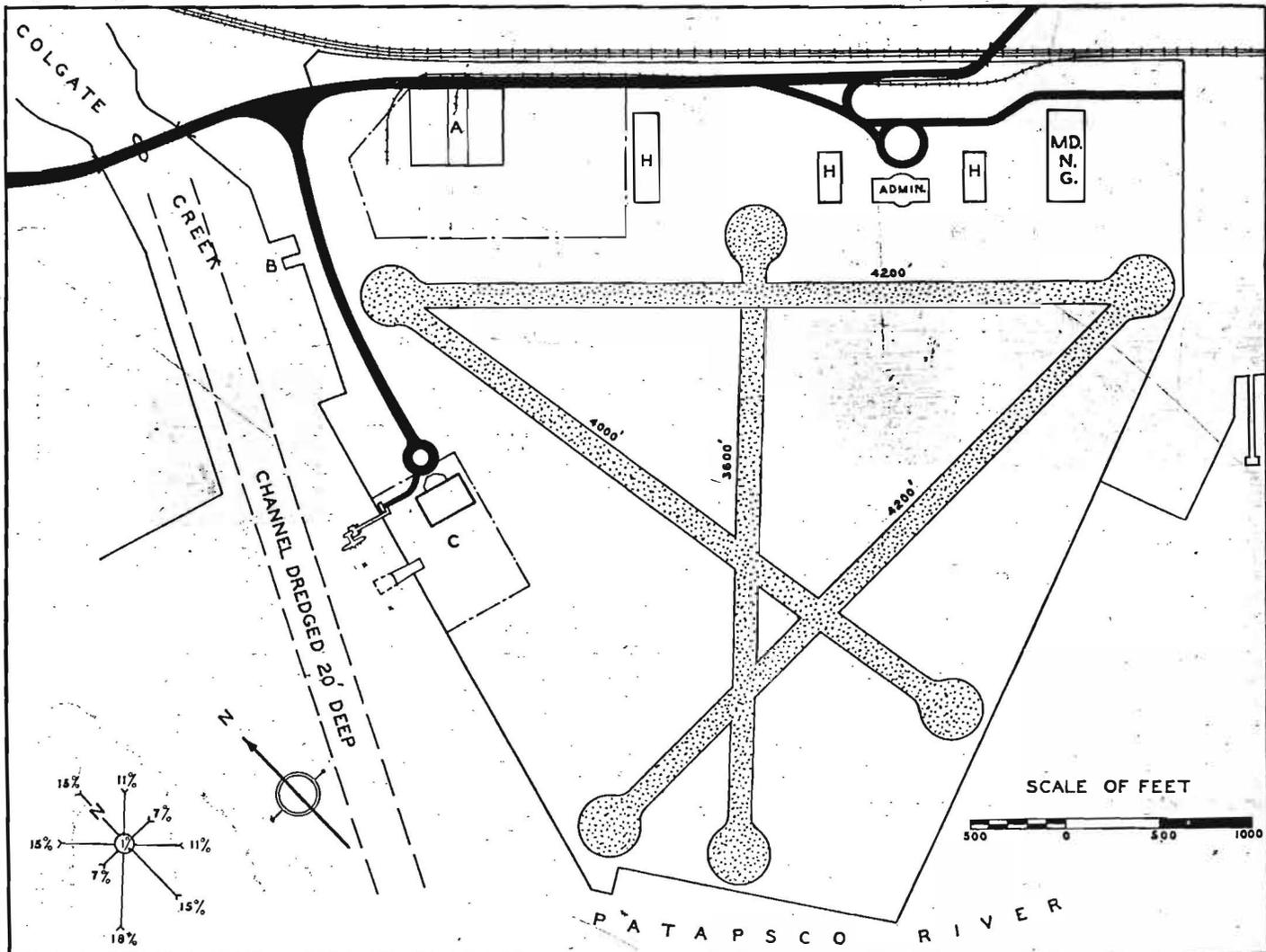
As shown in the accompanying plan of

this project, three runways face the Patapsco River into 40% of the wind; three of the four runways will be more than 4000 ft. in length. Water flying conditions are considered to be excellent inasmuch as the river is comparatively free from driftwood and there is a sufficiency of open water with clear spaces up to 25,000 ft.

The airport is filled-in land, 12,000,000 cubic yards of silt of high clay content being taken from the channel when it was dredged a few years ago and 3,600,000 cubic yards of silica now being trucked from a pit a short distance away.

At present the only building on the field is the Curtiss Caproni factory (A) which will be used by Pan American until next spring when a new hangar and office (in the area marked C) is scheduled to be completed. Ramp B will be used in conjunction with Hangar A when a plane is to be removed from the water for servicing, etc., in which event the same maintenance procedure being done at Port Washington base will be followed. Some of the equipment now at Port Washington will be shipped to Baltimore for winter operations.

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Layout of Pan American Airways' new trans-Atlantic terminal being constructed at Baltimore, Md.

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evident. The number of airplanes and pilots engaged is not nearly so important as the *quality* of the airplanes and the *skill* of the pilots. If squadrons of bombing planes can hit nothing but non-combatants or the good earth, while missing the military targets, it is of little matter how many bombs they drop. If in the air pilots can only fly around shooting off ammunition, and miss hitting the enemy plane, they might better give their machine guns to the infantry.

To be of real value, air forces must be trained to a much higher degree of efficiency than anything we have heard of yet in China or even in Spain. And they must be used strategically. For airplanes used as tactical weapons become only Army auxiliaries.

So long as air forces remain tied to ground armies, so long as their use is dictated by ground generals who do not comprehend air strategy, just so long will war birds continue laying goose eggs. Air Power is a high-flying bird and it does not nest in dug-outs occupied by the General Staff.

## TRANS-ATLANTIC BASES

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The hangar, now under construction, was designed by W. Watters Pagon, consulting engineer for the city of Baltimore. It measures 190 ft. x 270 ft., the entire structure being mounted on four open cylinder type caissons set 100 ft. on centers in the width and 140 ft. on centers in the length. They are constructed by driving wood piles 59 ft. into the earth, and eight concrete-encased steel H beams are driven in pairs at a slight angle. This is then encased by 20 ft. diameter concrete caissons varying from 36 ft. to 44½ ft. deep and tied in by a 30 in. concrete cap with steel top plate shimmed to proper level. The four caissons are tied by steel girders forming a "floating" foundation for the hangar which will remain level even if portions of the surrounding area should settle. Provision has been made to permit the construction of additional hangars on the plot, which has been leased by Pan American Airways.

## BEARINGS

More than 18 different types of aircraft ball bearings for controls, control surfaces, landing gear mechanisms, and other applications are illustrated and described (with complete specifications) in the 34-page *Aircraft Ball Bearings*, just released by The Fafnir Bearing Co.

The catalog states that Fafnir ball bearings, approved by the U. S. Army Air Corps and the Bureau of Aeronautics, reduce friction and eliminate sloppy or binding controls throughout the air-

plane's life. Fafnirs are double-sealed, and packed with a supply of temperature-resistant grease sufficient for entire operating life. Dimensions and tolerances lend themselves to good design and economical shop practice. The catalog embodies a tracing sheet showing outside diameter of each type arranged in series in relation to bore size, for the convenience of engineers and draftsmen in laying out design. Copies are readily

available by writing to the manufacturer.

Doors mounted on tracks provide a 35 ft. clearance, and can be opened on all sides except where the administration offices join the hangar.

Roof of the hangar is mounted on the underside of cantilever beams, cutting by about 35% the volume of space it will be necessary to heat in cold weather. Because of the funicular shape that results from the type of construction used, rain water drains through the four columns.

The passenger loading runway extends into the water on piles for part of the distance and on floats for the remainder. Facilities are provided for fueling the plane from this point. The ramp adjacent to the loading runway and extending 200 ft. into the water, is designed to support 25,000 lbs. in any 15 ft. circle.

At this time Baltimore is served by both Eastern Air Lines and American Airlines, Inc. American operates one round-trip daily, service being on the Southern Transcontinental route extending from Boston and New York to the West coast via the Southwest. Eastern operates seven trips a day into Baltimore, four from New York, and three from Washington, and will also operate the connecting service. Passenger deplaning at adjoining Logan Field are transported to the marine terminal (about 1 mile away) on buses, the distance to the airport from the city being about seven miles.

## SEALING SHEET METAL SEAMS

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Knowing these characteristics, application depends only upon detail arrangement, and a few notes on technique should be of interest.

1. If it is desired to have the cement set quickly, gasoline should be used; kerosene will give a slower dry. A still slower hardening will result from kerosene lubricating oil.

2. If the cement is oozing out along the joint, it is tight; if it is not, kerosene should be sparingly brushed along the joint on both sides.

3. In applying to a stringer, for example, select the proper width, cut to

length. Lay tape on absorbent material (cellolex, etc.) and brush one side with the activator selected. Press into place. (This procedure will keep the exposed side dry and the operator's hands clean.)

When the plating is ready to be applied, the tape should be moistened in the area to be covered by that particular piece, and clamps or machine screws set. It is desirable to have the tape on the stringer at least 24 hours (usually longer than this) before riveting. There is no time limit for closing the joint. If the rivets are not set soon after the plating is added, both edges and the exposed holes must be brushed with kerosene.

4. To keep the work looking clean, the superfluous cement should be removed with a kerosene-soaked rag. This cement comes off readily when still soft.

5. At points where there are joggles, reinforcements, or other points likely to cause trouble, a dripping coat of neoprene type I-T cement should be brushed into the joint before riveting. Excess of this material can be removed by rubbing with the fingers.

6. After completion of the structure, I-T cement should be brushed around the fittings and around other points which may be suspected of porosity. Material which does not flow into the joint after it has set should be rubbed off.

7. Rivets should not be coated with cement, primer being more desirable from the protection standpoint if the airplane is water-borne or if it is intended for coastal or Naval service. A good rivet should be tight.

8. The tape should not be submerged in gasoline or kerosene to activate the cement, because continued submergence in either will eventually dissolve the cement.

Minor repairs can be easily affected by using this material, as opposed, for example, to varnish. This is particularly important if the aircraft operates some distance from its servicing base.

Trimming the tape after completion of the structure is readily accomplished by applying a nicrome wire resistance at red heat to the exposed part. A wedge ground bakelite or micarta block will work satisfactorily for this purpose.

## TRADE LITERATURE

available by writing to the manufacturer.

### LIGHTING

*Greater Lighting Efficiency*, an illustrated booklet (Bulletin 520) published by General Electric Vapor Lamp Co., Hoboken, N. J., gives facts, figures and a description of both the 33" and the 50" improved horizontal Cooper Hewitt lamps. Redesigned for better industrial lighting, particularly

for precision work of all kinds, the new lamps are improvements over former models, providing increased light output per watt, instantaneous starting, horizontal suspension, and greater operating stability.

In a section of engineering data, information is given for computing the proper spacing of these lamps to obtain any given illumination level. In addition, photometric ratings for both the 275- and 350-watt lamps are given, as well as the essential dimensions and layout of lamp suspension.

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source on  
Port Washington

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