Civilian Uses for War-Developed Radar Promises To Develop Into Tremendous Industrial Factors

Played Important Part In Winning the War for Us—May Win the Peace

By Winfield J. Dryden
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"Never before did so many owe so much to so few." This expression of Winston Churchill referred to a few airmen and small ground force on the British isles. The same may be said in regard to radar.

Submarines were detected in the night, bombers in the clouds, ships in the fog and troop and land movements in the dark, miles away. Our paratroopers were landed by radar aid, our ships safely escorted, our bombers guided and our troops led by radar.

Without radar the war in Europe would still be raging, authorities believe. Radar, making the accurate bombing of Germany possible, as well as providing safety for the transportation of troops, actually made victory on both fronts a reality, contributing a big share to the early peace.

It has cost the nations hundreds

During the conference held at Mena house, Cairo, in November, 1943, President Roosevelt, Prime Minister Churchill and Generalissimo Chiang Kai-shek were guarded by radar. The radar post shown was built among the historic pyramids.

of millions of dollars to develop radar. No peacetime industrial organization had the money, the facilities, knowledge or desire to fully develop radar, to bring it to its present state of development. It required a nation at war, led by farseeing individuals, to accomplish the almost impossible—with millions of dollars back of the development, and skilled men with the determination to succeed.

Radar Peacetime Factor.

Radar has many known uses for peace. Postwar travel will become safer. Thousands upon thousands of lives will be saved due to the employment of radar in the air, at sea and on land. Radar sees all, knows all, and tells all. It warns of pending catastrophe and provides the eyes for men to see in order to prevent accidents on land, sea or air.

The discovery of radar may be classed as accidental. Research workers engaged in short-wave experimentations, nearly 20 years ago found that when waves were beamed on a city, there were oscillations on the dial when autos, trucks and other factors interrupted the wave. Soon afterwards it was found that planes in the air interrupted the waves beamed skyward. It was the next step that measured distance in relation to time interval that brought about the birth of radar.

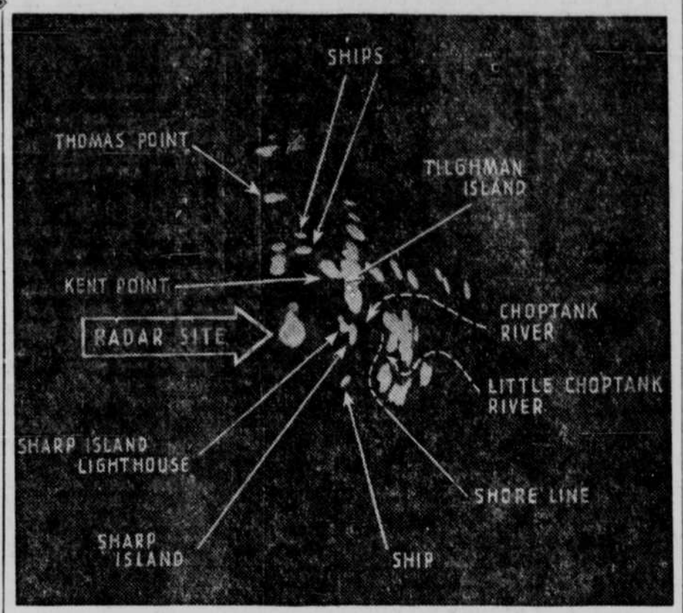
What Radar Is.

Radar is an apparatus that sends out short-wave impulses in a narrow, concentrated beam, impulses that are reflected from an object they hit and are returned on rebound to the receiver. It is based on a simple principle, as simple as the occurrence of an echo.

Radar waves traveling with the speed of light, 186,000 miles a second, streaking across space and rebounding from the target to return to their starting point.

At comparative long range it can pick up cities, determine water bodies; pick up ships in the fog; planes in the clouds; submarines or icebergs on dark winter nights. The distance of a target from the radar transmitter can be determined.

If one-thousandth of a second intervenes between the outgoing and incoming signal, then the round-trip distance the radar traveled would be one one-thousandth of 186,000 miles



Radar equipment recently made this "search" of surrounding terrain. Lettered on the photograph of the plan position, indicator scope, are designations of points picked up by the radar pulse.

a second, or 186 miles. The range of the object would therefore be half of 186 or 93 miles. Radar has been perfected to see beyond the horizon, but it will not see through water at present stage of development.

Physical Make-Up.

The actual physical make-up of radar sets varies. Uses and manufacturers will develop different types, as has been true with radios, automobiles or planes. In general, however, they are made up of the following parts:

1. A radio-frequency oscillator, or vacuum tube or group of tubes. These oscillating at a desired frequency send out into the air the waves.

2. A modulator sends out the direct bursts of the short-waves, which enables the receiver to handle them when they return. Each burst of energy is about one-millionth of a second long, the pause between the bursts being a few thousandths of a second in length.

3. An antenna, which directs the waves on their take-off, and beams them in particular direction and distance. It is the beaming on a fixed area. The antenna is adjustable to cover any part of the entire horizon as it revolves in a circle.

This photo made during a demonstration of a mobile trailer-mounted radar set shows the illuminated oscilloscope as the image of a bomber, flying at low altitude, came into the range of the radar beam. During war the antiaircraft gun's crew would receive exact location of the bomber immediately.

4. The receiver is the set which picks up the returning waves, similar to a radio receiving set.

5. The indicator or the brains, is the device which takes the information gathered by the radio waves and presents them in readable form. The waves are transformed into light patterns on a radar screen. It may consist of one or more cathode-ray tubes similar to the ones used for screen on a television set. On this screen appears a visible electronic beam. Returning radar waves cause the beam to deflect and it is the pattern of deflection that tells the story to the operator.

Furnishes Weather Data.

Weather forecasting has been added to the scores of uses for peacetime radio development. Prompt and accurate weather information is already being furnished through radar installations at Wright field, Ohio.

When used by pilots of commercial planes, all that is necessary is for the pilot to push a switch marked "weather," and he gets a picture of advance cloud formations on a special screen. Tracking clouds instead of a target, the screen will indicate approaching storms at a distance of one to two hundred miles.

This use of radar, it is believed, will result in the saving of thousands of lives annually, in addition to property loss caused by planes crashing during storms.

The planes will be guided around storm area. There is so much moisture in turbulent clouds that the signals are reflected from the drops of water back to the plane. Thus even in darkness, the pilot can detect such an area ahead and go around it.

Air travel will become safe when radar is in universal use. Not only will pilots be able to avoid bad weather, but they will be able to see mountains through clouds by day or night, and thus avoid crashes.

It offers additional safeguards to air travel, by doing away with collisions in the air, and provides a means of safe landing when the field would be otherwise invisible to the pilot.

Aids Ocean Travel.

On the seas, the use of radar will be just as effective as in the air. It will aid the ship captains in avoiding icebergs, other ships, wrecks and land obstructions that have caused the loss of thousands of lives in peace time.

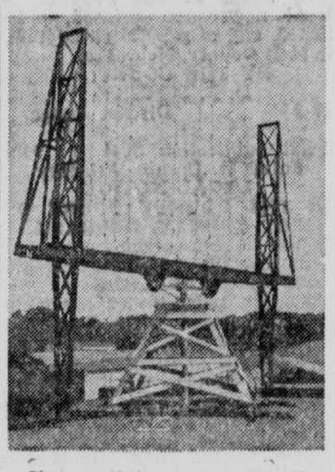
Radar will continue to serve the navy in peace, and its installation on ships will make surprise attack impossible. During war, radar has been an important factor in accurate aiming of long-ranged naval guns.

Its uses on land have not been fully developed. While radar will report weather conditions, direct landing of planes, there is still a variety of uses for which it will be adapted.

Among the recent advocated uses is the installation of radar on the front and rear of all trains. This will aid materially in the prevention of railroad accidents, which have mounted materially.

War officials are already busy in developing the radar so that it will become an effective weapon against the atomic bomb, just as it was against the V-2 and other bombs launched by Germany. A good part of the failure of Germany to wreck England was due to installations of radar.

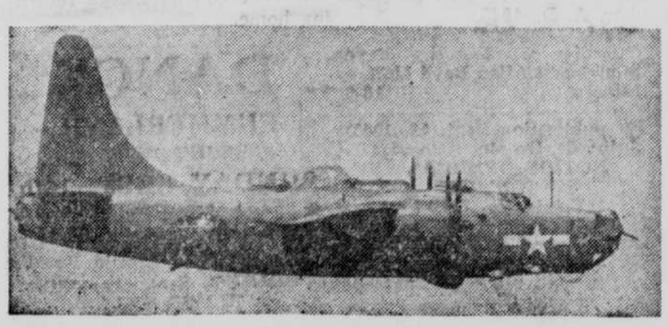
The final value of radar in peace is not known. It is believed that its usefulness will find no limits. It is known that radar's uses in peace will be even more beneficial than its use in war had been destructive and deadly.



Close-up of the antenna of the first complete radar, installed "topside" a building at the Naval Research laboratory in the late 1930s. It is a so-called "dirigible" antenna, meaning it is so mounted that it can be turned to allow for around-the-compass search. This older model has recently been improved.

The Civil Aeronautics administration is experimenting with appliances loaned by the army and navy. Their hope is to develop instruments to enable tower controllers to see all aircraft within miles, and to install collision-warning devices.

In the rapid growth of commercial aviation, which is certain to follow immediately after the war, radar will bring new safety. It is held by some authorities that radar installments on planes will be as much a part of the plane's equipment as brakes or lights are on a car.



THE CUSTOMER-WORM TURNS

The characters are a clerk and Mr. and Mrs. Elmer Twitchell. The scene is almost any store. Time—Six months after the war.

Clerk (as Mr. and Mrs. Twitchell appear at his counter)—Well?

Elmer—Well, what?

Clerk—Do you wish something?

Mrs. Twitchell—Don't tell him!

Elmer — Not a chance, honey; we'll make him wait.

—•—

Clerk (smiling)—What can I do for you?

Mrs. Twitchell — He's actually smiling! Him, of all people!

Elmer (handing her a paper) — Here's something for you to read, honey. I'll tackle a magazine.

—•—

(They sit down on camp stools which they have carried to the store, and ignore the clerk.)

—•—

Clerk—If there's something I can show you. . . .

Mrs. Twitchell — Can't you see we're busy?

Elmer — Take it easy. We'll get around to you in time.

—•—

Clerk — After all this is a store catering to the public, and I'm the clerk here.

Mrs. Twitchell—Oh yeah!

Elmer—Do you know who we are?

Clerk —You're customers, aren't you?

Mrs. Twitchell — Don't tell him, Elmer!

Elmer (as the clerk seems impatient) — One of them guys who's always in a sweat, eh!

—•—

(The Twitchells yawn and continue reading, ignoring the clerk quite completely for 10 to 15 minutes.)

Clerk (pleadingly) — I wish you'd let me wait on you.

Mrs. Twitchell — Don't try to rush us!

Elmer—You want us to let you wait on us ahead of other clerks in this store, eh? You're somebody important, I suppose.

Clerk (who has, with the coming of peace, reconverted to the prewar manner) — If you don't see what you want ask for it! We aim to please! A satisfied customer is a solid foundation for business success. . . .

Mrs. Twitchell — Quick, Elmer, the aspirin!

—•—

Clerk. — The secret of this store's popularity is customer-service. My time is your time! May I assist you promptly?

Mrs. Twitchell — Tryin' to intimidate me, eh?

Elmer—Ignore the big bum, dear.

—•—

Clerk. — Aw, come on; lemme wait on you!

Mrs. Twitchell — Nothing doing. If you don't like it go to some other store!

Clerk — But it's my duty to wait on customers and . . .

Elmer — You ain't the only clerk in this place. Wait for your turn like the rest of 'em.

Mrs. Twitchell — When we're ready to be waited on in a polite manner we'll let you know.

Clerk — Doncha know there's a peace on?

The Twitchells (swooning) — That does it!

• • •

NOT YET, BUT SOON

"How many gallons? Fill 'er up!" . . .
How sweet those words once more!
The long dead words of yesterday
That disappeared with war;
"How is ya windshield? How's the oil?" . . .
"Just name the type and brand" . . .
What joy and rapture this now brings
Throughout the weary land!

What kind of meat? A tenderloin?"
"A porterhouse? Why not!"
"I wish you'd take these nice loin chops" . . .
"These hams will hit the spot!"
Oh, what a thrill when talk like that
Is looming just ahead—
And not a butcher says, "You'll have
To take stew meat instead!"

To find a guy who'll do a job
For ten bucks at the most
And not want forty dollars just
To paint a hitching-post!
To live as once we used to live
Quite kindly man to man
With patience and with courtesy
Within the post-world plan!

• • •

He stood on a corner with two suitcases, a letter to the secretary of labor, a kit of tools, a copy of "How to Live Within an Income," a copy of the classified ad pages, a bathing suit and a worried look.

"Whatcher doin'?" a friend asked.

"I'm reconverting," he replied.

• • •

After the peace, Japan is going to have a wonderful time running around with cameras photographing American soldiers, sailors and marines.

SEWING CIRCLE PATTERNS

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Scalloped Princess Dress

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Underground Parking

The parking problem in Buenos Aires is relieved by an enormous area built under one of its huge plazas. A boulevard more than 450 feet wide is the roof for this parking center, which covers 16 blocks.

ASK ME ANOTHER?
A General Quiz

The Questions

1. Does an ostrich bury its head in the sand in order to hide?
2. In playing the flute, the velocity of air necessary is equivalent to that of a hurricane, or at the rate of how many miles an hour?
3. "God made the sea; we made the shore" is a proverb belonging to what nation?
4. The temperature of the moon drops 400 degrees at sunset. Why doesn't the earth's temperature drop considerably?
5. For what purpose was the Leaning Tower of Pisa erected?

The Answers

1. No. It grubs for food with its bill.
2. Seventy-five miles or more.
3. The Dutch.
4. The earth is blanketed by air which holds the heat caused by the rays of the sun.
5. It was erected as a bell tower for the Cathedral of Pisa.