GROWNUPS

By W. E. Hill

The night worriers. Papa and Mama are in a terrible state about Blanche. They forbade her going to the pictures with the Finnegan boy, and what did she do but sass her parents and GO! And what CAN they do about it!

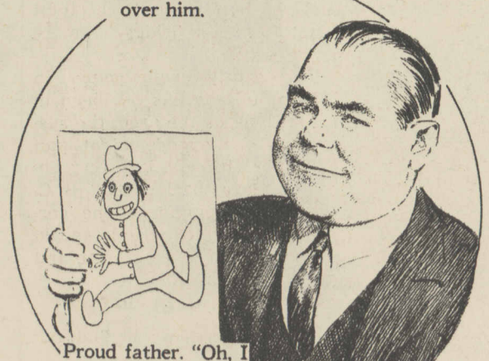
The teasers. Cousin Laura is teasing Arthur about the little Walpole girl. Wants to know if it's true—she kissed him before everybody at Gladys Botnik's party. Arthur doesn't think Cousin Laura is half as clever as she herself does.

The kisser. There's no dodging her. Says, "All you little folks must come give old Cousin Mamie a great big kiss!"

The good examples who can't get over how terrible the young folks are nowadays, with their horrible manners. THEY were little ladies and little gentlemen, when THEY were young, always helping their elders around the house, and never out later than eight-thirty!

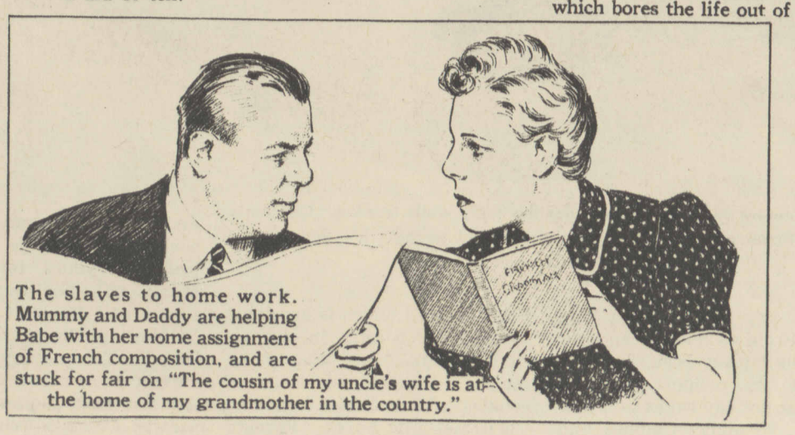
The bachelor who is nervous with children. A little afraid of them. They sense it right away, and lord it over him.

The aunts who fuss about looks, and pull and push and yank at hats and coats. They're never satisfied.



Proud father. "Oh, I know it has faults, but I'll say it's a pretty darn good piece of work for a kid of ten!"

She likes children and thinks she knows just what they like best. Talks down to them about the little doggies and the little birdies and such, in a baby tone of voice which bores the life out of them.



The slaves to home work. Mummy and Daddy are helping Babe with her home assignment of French composition, and are stuck for fair on "The cousin of my uncle's wife is at the home of my grandmother in the country."

Radio Boosts Air Safety

By WAYNE THOMIS

NO FACTOR among those elements that have brought about the tremendous advances in air transportation of the last five years has been more important than radio. It has become the backbone of aeronautical navigation. Yet the radio that has been available to the aeronautical industry has always been somewhat unsatisfactory.

Both communications and navigation have been conducted in frequency ranges where static often blots out signals. And as airplane speeds have increased, peculiar types of static due to the passage of a plane through clouds of widely varying static electrical charges have developed. Present-day radio is excellent until weather conditions become bad.

But the day is near when what appears now to be static-free radio will be available for aeronautical use. Experiments simultaneously conducted at a number of different sources are proving that by moving into what now are known as ultra-high frequencies most of the problems of radio that have developed in the past can be easily solved. By 1942 the new phase of radio should be in full swing.

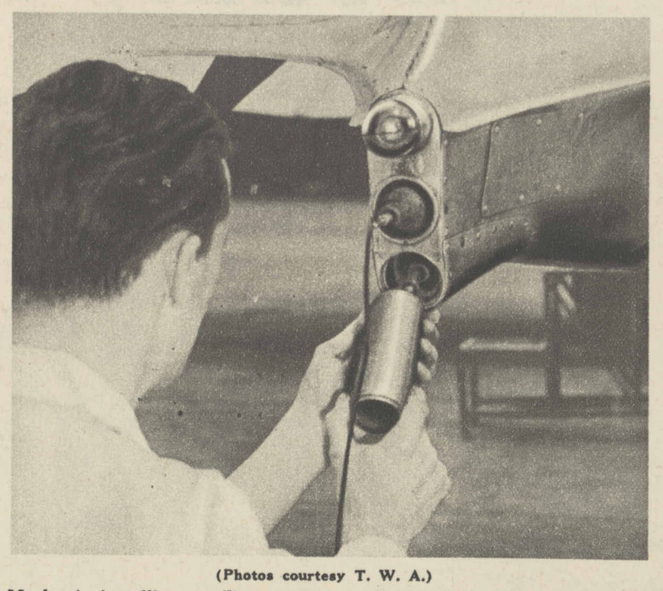
Experiments by the Civil Aeronautics authority, by a number of large radio manufacturers, and by the air lines themselves — notably Transcontinental and Western Air and United Air Lines—have shown that the ultrahigh frequencies are static-free even in the midst of the hardest rain, thunder, and lightning storms, are perfect for directional radio, and are free from solar interference.

They virtually will mean perfect radio communication between planes and the ground at all times. Furthermore, they open up a limitless new field for development in radio navigation and safety measures.

Today the federal airways radio range beacon stations—the chief radio navigational aid for all types of flying—are limited to signal output on frequencies ranging between 200 and 400 kilocycles. Such signals are readily affected by static that often is so loud and continuous as to drown out the station signals.

Furthermore, the present-day radio stations are much affected by what radio engineers call night effect. Night effect changes the range at which the signals may be heard and causes their directional reliability to vary considerably.

The frequencies used for ground-to-plane communications are somewhat higher, being in several bands ranging from 3,100 to 5,800 kilocycles. Even these frequencies are subject to static effects, although perhaps less so than the radio ranges.



(Photos courtesy T. W. A.)

Mechanic installing auxiliary antenna coil in tail of airliner below the main antenna and the tail light.

All the troubles and difficulties listed here—and this is only skimming the surface — apparently are solved or eliminated in the use of the ultrahigh frequencies. By ultrahigh frequencies engineers mean signals sent out on frequencies so rapid that instead of speaking of them in so many thousands of cycles they speak of them in millions of cycles. The experiments to date indicate that bands between 60 and 125 megacycles will give practically perfect performance for both navigation and communication.

The signals that come from transmitters using these frequencies perform much like invisible beams of light. For instance, they travel in straight lines that shoot off the earth and do not return. These signals will not penetrate solid bodies and do not bend.

An explanation of this phenomena might be in order. The radio signals from lower frequencies go out in all directions from a transmitter antenna. Some go straight up until they strike what is believed to be an ionized layer of electrical particles that now is called the Heaviside layer. This is at some undetermined distance from the earth and is believed to vary from 25 to 100 miles.

After striking the Heaviside layer the signals of lower frequencies rebound. Some of the signal energy rebounds straight back to the transmitter station, some strikes the layer at an angle and bounds off to strike the earth hundreds of miles away. The constant stream of signals from the lower frequencies goes out and rebounds in such a manner as to more or less blanket a given area.

As frequencies go up the direct signals seem to penetrate the Heaviside layer deeper and deeper and and to rebound at a greater and greater angle.

Experiments have shown that signals sent out on 66 megacycles and above go straight out and are never received again. The distance at which these signals may be received on the ground is the horizon, since the signals go out in the shape of a huge inverted cone, the point of which is at the transmitter.

In an airplane, however, the horizon expands as height is gained. In just the same way the range of an ultrahigh-frequency station increases as an airplane climbs. It is estimated that such a station will have a range of 200 miles at 10,000 feet. The range increases indefinitly with height.

This is a direct benefit to aeronautical radio, because two or three frequencies can be used for stations all over the United States instead of the large number now necessary with 300 federal airway radio stations crowded into the band from 200 to 400 kilocycles. The multiplicity of stations has made it necessary to duplicate frequencies.

For instance, Big Spring, Tex., and Cheyenne, Wyo., are on the same frequency. Under certain weather conditions pilots tuned to one of these stations will receive both, to the complete confusion of the man who is trying to navigate his airplane by these signals.

The CAA may decide to use 66, 76, and 86 megacycles as the three frequencies for its radio ranges. Assume, then, that the airway between Chicago and New York was equipped with these new ultrahigh-frequency range stations.

The first station westbound from New York could be on 66 megacycles, the second on 76 megacycles, and the third on 86. Then the fourth would be 66 megacycles, the fifth on 76, and the sixth on 86. A pilot flying within range of the first station could not possibly hear signals from the fourth.

At present there are fourteen different frequencies used on the Chicago-New York airway alone. By proper spotting it would be possible to cover the entire country with stations using only three or perhaps four ultrahigh frequencies.

In addition to all the other advantages of the ultrahigh frequencies, the equipment will be simpler, lighter, and less expensive than the receivers and transmitters in use today. T. W. A. and United are already planning to switch their company ground-to-plane stations to the higher frequencies by 1942.

The entire air line industry—speaking through the Air Transport Association of America—has asked the CAA to equip the Chicago-New York airway with the new ultrahigh-frequency range beacons in 1939. This request probably will be granted.

Operator in two-way contact by radio telephone with a transcontinental airliner.

Testing a two-way receiver in the T. W. A. shop.

KNOW YOUR HORSES

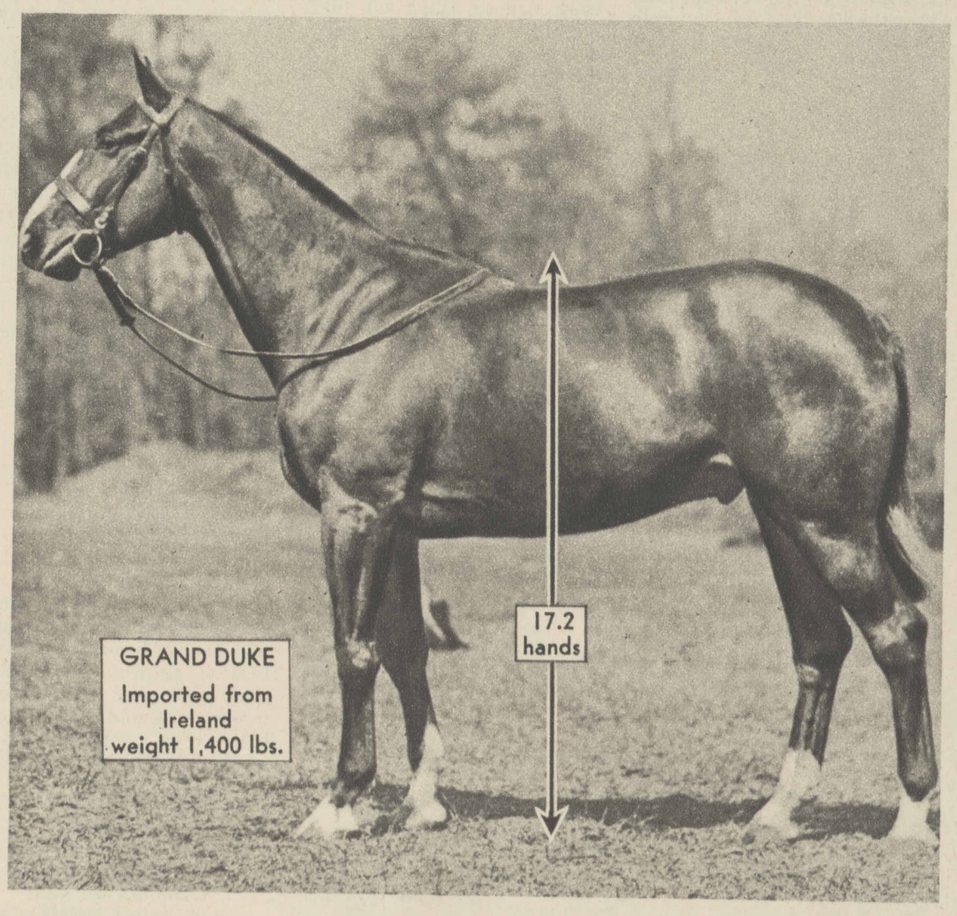
By CAPT. MAXWELL M. CORPENING

IRISH HUNTER For a pleasant ride over hill and dale, hurdle and trail, a horse lover will find the Irish hunter a mighty pleasant companion. The hunter's principal characteristics are disposition and size, and for a big horse this one is exceptionally agile and expert with its feet.

The magnificent horse shown here stands as a model of the breed. Although of tremendous size, it would neck rein, change leads, start, and stop just like a polo pony, and in addition would carry 200 pounds over a five-foot hurdle with ease.

This breed is the result of efforts in Ireland to develop an animal suitable both to work and play. Frequently an Irish plowboy's instinct for sport will get the better of him when a hunt rides by and he will unhitch his plow mount and gallop over the hurdles with the best of them. The type of terrain in the old country—with many banks and stone walls—has necessitated the placing of great stress on nimbleness in action. Irish hunters pick their feet higher than do thoroughbreds and are less likely to stumble or rap a jump.

There is so much stress and strain on a horse's legs and back muscles in jumping that one should be careful to select an animal large enough to carry the rider's weight. The heavy rider would be wise to consider an Irish hunter for a field horse—or, for that matter, just ordinary park riding. Generally speaking, the slender, light person rides better than a heavier one, hence the good disposition of the Irish horses should be more suited to the heavier person's needs.



Next Sunday—Five-Gaited Horse.