

cult task. The directions that come with such sets tell in detail how to do it, and generally the only tool required is a screw driver. Mostly, such changes will have to be made after the frequency

shift takes place, otherwise you could not set the buttons accurately. And while you are waiting to make the change, you can tune with the dial.

Science News Letter, March 22, 1941

ASTRONOMY

Astronomers' 1942 Almanac Has Material From Abroad

Information About Saturn Furnished by Germany; France Contributed Data on Jupiter's Satellites

DESPITE the war, foreign governments are still collaborating with the United States in producing the astronomer's bible, *The American Ephemeris and Nautical Almanac*, published each year by the U. S. Naval Observatory, part of the Navy Department.

The *Ephemeris* gives detailed tables of the positions of the sun, moon, planets and bright stars, information about eclipses, lists of observatories and other information that is essential to the astronomer. The volume for 1942 has just been released, so students of the heavens can now, if they wish, make plans for the coming year.

Director of the Nautical Almanac Office is Dr. W. J. Eckert, formerly of Columbia University, who assumed this post last year following the retirement of the former head, Dr. James Robertson.

Writing in the preface to the 1942 volume, Capt. J. F. Hellweg, U.S.N. (retired), superintendent of the Naval Observatory, states that the tables showing the positions of Saturn's rings, and the times when his moons are best seen, were furnished by the *Berliner Jahrbuch*, the corresponding publication of Germany.

The office of the similar French work, the *Connaissance des Temps*, furnished the tables of Jupiter's satellites. From the British *Nautical Almanac* office came tables of the positions of the sun, moon and planets. As in the volume for 1941, however, the name of the Spanish *Almanaque Nautico* is missing. For 1940 they furnished star positions.

Cooperation of the U. S. *Nautical Almanac* with foreign offices was authorized by Congress in the 1912 Naval Appropriation bill. This eliminated much needless duplication of work in the various countries. This act provided,

however, that the work on the *Ephemeris* be so conducted that, in emergency, all the tables needed for the navigation of American ships, both naval and commercial, could be prepared without any foreign assistance. This principle has been carefully followed ever since.

Only two eclipses of the sun are scheduled for 1942, the *Ephemeris* indicates. One is on March 16-17, visible near the South Pole, the other on Sept. 10, near the North Pole. There will be three eclipses of the moon, two partial, and one total, on Aug. 26. This will be seen throughout North America. Also, on a number of occasions during the year, the moon will "eclipse," or occult, the bright star Aldebaran.

Science News Letter, March 22, 1941

MILITARY SCIENCE

Inventions to Widen Arcs Of Fire from Machine Guns

TWO inventions, designed to give machine gunners in warplanes better all-around fire command, have just been granted patents by the U. S. Patent Office.

The first, covered by patent 2,233,642, is the design of John C. Sanders of Seattle. It provides for mounting three machine guns in a vertical zone around the fuselage of a plane. One of the guns is placed directly on the bottom, the other two on the sides near the top, so that the whole circle of the fuselage cross-section is divided equally between them. They can thus be trained so that at least one gun, and sometimes two, has fire command over any enemy approaching from above, beneath, or from either side.

Fore-and-aft command through at least a hemisphere is obtained by mounting each gun in a streamlined "blister" or



GRINDING

Once the correct reference face has been established by X-ray, the crystal, held securely at the base of the adjustable cylinder, is ground to the correct angle on a manually operated grinding spindle.

bulge. The guns lie along the long axis of these bulges when not in use, thereby minimizing the air drag due to projecting barrels and from the more abruptly jutting type of gun turrets now in use.

Each of the three guns may be served by an individual gunner, or, in smaller planes, one gunner may shift from one piece to the other, to meet changes in enemy position. With this system of mounting, the inventor claims, the entire plane is surrounded in a protecting sheath of overlapping fire fields.

Rights in the patent are assigned to the Boeing Aircraft Company.

The other invention, covered by patent 2,233,918, is a design for a nose turret for twin-engine bombers, devised by Howard M. Fey of Portland, Ore. It consists of a sphere made of safety glass or other transparent material, motor-driven to rotate from nearly straight-down to back of straight-up, and through slightly more than a half-circle from side to side.

Within this sphere sits the gunner, his hands and feet on a set of controls like those of a typical airplane. Regardless of what the pilot in his cockpit

above and back of the turret may be doing, the gunner "steers" his turret as if it were a fighter plane, and when his sights bear on his target he fires.

The turret may be armed with either a single light cannon or with one or more machine guns.

Science News Letter, March 22, 1941

GENERAL SCIENCE

Students To Be Deferred If Rated As "Necessary"

Memorandum Sent by Gen. Hershey to State Directors Tells How Cases Should Be Handled by Local Boards

A STUDENT training for any occupation essential to the national health, safety or interests may have his selective service deferred provided the local board finds that student to be a "necessary man," Selective Service Deputy Director Lewis B. Hershey told all state directors in a memorandum just sent to them.

This action was taken in response to recommendations by the National Academy of Sciences and the Subcommittee on Military Affairs of the National Committee on Education and Defense made at the request of Dr. C. A. Dykstra, Director of the Selective Service System.

Educators, scientists, and other interested persons have expressed marked

concern about the status of students in professional, scientific, technical, and other highly specialized fields after July 1, when the group deferment of students provided by the Act expires, Gen. Hershey said.

After July 1, there must be no deviation from the statutory prohibition against group deferments, he warned. But any individual student may be deferred if the local board finds him to be a "necessary man."

In making this decision, the local board should consider each individual case on its own merits. In reclassifying students, all facts in the possession of the local board at the time of the student's classification in I-D or I-E should again be given full consideration, together with any evidence of changed status that may have occurred since classification.

Consideration should be given, the memorandum stated, to such factors as the length of time which the student has been pursuing the course in question, his relative progress and standing in the course, and his relative chances for employment. Contracts of employment or other reasonable assurance that the registrant will engage in an essential activity may be considered as evidence by the local board.

"The intelligent selection or deferment of registrants, as the national interest may require, is the fundamental purpose of the Selective Training and Service Act of 1940 and the Regulations prescribed thereunder," Gen. Hershey's memorandum declared.

"It is clearly the duty and responsibility of the local board to determine the classification of each registrant."

Although deferment in Class II-A may not exceed six months, the deferment may be renewed from time to time if the local board finds that such continuance is justified.

Another step to guard against loss to the nation of the services of qualified professional men was taken by Gen. Hershey in another memorandum to state directors in which he stated that professional students who have completed their course of instructions on July 1, 1941, but who will then be in training or preparation for examinations for license in their professional field, may be deferred for a relatively short period pending the holding of the examination.

Science News Letter, March 22, 1941



FOR CONTROL

This is the way the crystal section looks after it is ground and ready for use in controlling the frequency of a transmitting station.

GENERAL SCIENCE

Draft Boards Urged to Give Consideration to Students

DRAFT boards are urged to give special consideration to deferment of graduate students in scientific, technological and educational schools and students in engineering and health services, in a resolution just passed by the New York Branch of the American Association of Scientific Workers.

After July 1, the group deferment of students expires, and local draft boards must consider the continued deferment of each student individually on its own merits. A student in these nationally important fields is put into the deferred classification if the local board finds him a "necessary man."

The Scientific Workers urge local

boards to take advantage of information that might be furnished by the National Roster of Scientific and Specialized Personnel and to judge the usefulness of such a student by standards provided in a report made at the request of Dr. C. A. Dykstra, director of the Selective Service System, by the National Academy of Sciences and the Subcommittee on Military Affairs of the National Committee on Education and Defense.

According to this report, defense needs clearly require careful consideration of requests for deferment for students in the following fields:

Medicine, dentistry and pharmacy.