These curves suggest the idea that with the application of stress the grains most favorably oriented for slip were initially deformed and hardened by cold work to resist further deformation. Protective oxide films on their surfaces, destroyed in the initial deformation, were repaired. The increase in potential in the anodic direction on initial loading was due to the rupturing of the protective film on these grains, and similarly, the decrease in potential, noted during the ensuing 40 to 50 sec, occurred as a result of film repair. Stresses concentrated in relatively more resistant crystals then deformed very limited areas of the specimen surface, during subsequent extension, but at a rate which prevented the film from re-forming. Cracking started at these film-free areas by an electrochemical process and the cracks increased in depth until the specimen fractured. As a consequence of continuous exposure of bare metal at the tips of the cracks, specimen potentials increased. The sudden decrease in potential immediately after fracture indicated that a protective film was formed very rapidly on the surface of the bare metal exposed by the fracture.

Extension rates and potentials were not obtai the square-section specimens used to determi crystallographic planes of stress-corrosion crack the stresses were removed after cracks had dev but before final fracture in these specimens. Da tained in this part of the work indicate that crys which cracking occurred were generally less fav oriented for slip than were those crystals in wh cracks developed, i.e., cracking occurred in cryst resisted the early deformation. The cracks pro in these specimens were approximately normal stress axis; they made large angles with the basal and they usually occurred on high-index cry graphic planes.

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[1] *For further technical details, see* Stress-corro cracking of the AZ31B magnesium alloy, *by Hugh Logan, J. Research NBS (Eng. and Instr.)* **65C,** *(1961).*

[2] Mechanism of stress-corrosion cracking in the AZ magnesium alloy, *by Hugh L. Logan, J. Research N* **60,** *503 (1958) RP2919; also, NBS Tech. News Bull.* *63 (1959).*

NBS and Navy Announce Change In Standard Frequency Broadcasts

A CHANGE in the broadcast of standard frequency transmissions has been jointly announced by the Bureau and the U.S. Naval Observatory, the two Federal agencies that coordinate transmissions of time and standard frequency. At zero hours Greenwich Mean Time of January 1, 1962 (7 P.M. E.S.T. December 31, 1961) the standard frequencies transmitted were made higher by 2 parts in 1 billion. This is 2 ten-millionths of 1 percent. The change is too small to be detected by ordinary radio receivers; that is, the nominal frequencies broadcast are the same, but it is significant to those using specialized equipment in precise scientific work.

The change was necessitated by irregular variations in the speed of rotation of the earth. Astronomical observations made at the U.S. Naval Observatory have shown that the earth was rotating at a successively slower speed each year from 1955 to 1958 and that since then the earth has been rotating at a faster speed each year. The cause of this irregular variation is not known.

Time pulses and carrier frequencies of the standard broadcasts are locked together. The frequencies transmitted are maintained constant each year with respect to Atomic Time, but are offset from Atomic Time by a specified amount to provide time signals which correspond closely to time as based on the rotation of the earth. The frequencies transmitted in 1962 will be 13 parts in 1 billion lower than that of the cesium atomic clock, whose frequency is 9,192,631,770 c/s. If such offsets were not maintained, it would be necessary to make frequent step adjustments during the year in the time signals broadcast.

U.S. stations whose frequencies were changed are WWV, Beltsville, Md.; WWVH, Hawaii; WWVL and WWVB, Boulder, Colo.; NBA, Canal Zone; NAA, Cutler, Maine; NPG, Jim Creek, Wash.; and NPM, Hawaii. The transmissions of the East Coast Loran–C radio navigation system operated by the U.S. Coast Guard were also changed in frequency. The Loran–C transmitters are located at Cape Fear, N.C.; Martha's Vineyard, Mass.; and Jupiter Inlet, Fla.

The transmissions of time and frequency of the United States are coordinated with those of Argentina, Australia, Canada, Japan, South Africa, Switzerland, and the United Kingdom. This coordination began in 1959. The standard frequency and time transmissions of these countries also changed on January 1, 1962.

The need for high precision in scientific measurements, in satellite tracking, in radio communication, and in navigation has made it necessary that frequency be provided with very high precision and that transmissions be coordinated. Transmissions of frequency are maintained constant to 1 part in 10 billion. This amount corresponds to 3 thousandths of a second per year, which is an appreciable quantity in many scientific applications.