NEWS OF CLASSES

1918

General Carlyle H. Ridenour was promoted in June from Colonel to Brigadier General for "conspicuous leadership during the recent Tunisian campaign." During the last war General Ridenur enlisted as a private; he later became a second lieutenant and was an Air Corps instructor at March Field. Deciding to make the Army a career, he joined the regular Army Air Service. Since the present war he has risen from lieutenant colonel.

Dr. William R. Hainsworth, vice-president in charge of engineering and research at Servel, Inc., Evansville, Indiana, has been named chairman of the Industrial Research Institute, an organization of representatives from various types of industrial firms for the purpose of cooperative study of their common problems.

Lt. Col. K. J. Harrison is with the U.S. Army Engineers at Phoenix, Arizona.

1919

C. J. Bjerke recently moved to Pasadena to live, although he is still connected with the Rainbow Oil Company of Wyoming.

1920

William C. Renshaw is now on active duty with the Navy, holds the rank of Lieutenant Commander, and is now stationed at San Francisco.

Charles R. Root, who was formerly an executive with the Fuller Paint Company, has been commissioned a Lieutenant in the Army Engineers and is now on duty at Fort Belvoir, Virginia.

1921

R. E. Hambrook was recently named Vice-President and General Manager of the Pacific Telephone and Telegraph Company for the Northern California and Nevada areas.

Major Smith Lee has traveled 11,000 miles between various Army camps, and was recently assigned to Camp Callan near San Diego.

Dr. A. J. Stamm of the Forest Products Laboratory at Madison, Wisconsin, is extremely busy, particularly in new lines of development and experimentation.

1922

Raymond W. Ager is an associate professor in electrical engineering at Cornell University where he is in charge of the new high voltage laboratory. He has also been doing some research work for the Navy.

Howard Vesper is Chief Engineer in charge of lubrication problems for the Standard Oil Company of California, with his office in San Francisco.

1923
20-YEAR ANNIVERSARY

Fellow Classmates of the class of 1923:

Herewith is a report on some of the activities in which we have been and are engaged, covering the past twenty years. Out of our class of 54 some 38 have replied to the questionaire and the data is presented herewith. Sixteen members were present at the banquet and were unable to give more data on the missing members, so it is now up to you readers of this column to write to the Editor with all corrections and additions. Later news will be welcomed in the next issue. With thanks to all who have and will help to complete our record of achievment, I am,

Sincerely yours,
Loren Blakeley
Class Secretary

C. Donald Adams is Chief Mechanical Engineer with the Riverside Cement Company in Riverside, California. He has a 17-year-old daughter.

J. R. Alcock is still with the American Cyanamid and Chemical Corporation in Covina, California, where he supervises the building and handles correspondence and orders for mining machines and reagent feeders used on critical metal ore concentration. He has two daughters, 11 and 14 years old.

M. B. Alcorn is an engineer for the Southern California Telephone Company.

Willard E. Baier is manager of the Research Dept. of California Fruit Growers Exchange. The war has brought him more of the same work he has been engaged in, including problems of concentrating fruit juice for export. He has a son aged 13 and a daughter aged 11.

W. L. Bangham is a building supervising engineer employed by the M. W. Kellogg Co. in the building of the Shell Chemical Company's plant which is part of the synthetic rubber program. Before the war he was engaged in civil engineering on the Federal Housing Project. He has three sons, 17, 15, and 11, and one daughter, 3.

Harold A. Barnett is a civil engineer with offices at 35 S. Raymond Avenue in Pasadena.

Loren E. Blakeley is now one of the Regional Waterworks Advisers with the California State Health Department, Bureau of Sanitary Engineering, on a civilian defense program surveying status and preparations for wartime operations. Before the war he was engineer for the Santa Ana Valley Irrigation Company and engaged in waterworks engineering and irrigation supply for 15,000 acres, mostly citrus, in Orange County. He has a son aged 7 and a daughter aged 12.

Arthur G. Duncan has been engaged in civil engineering work with the U.S.E.D. for some time and is now Associate Engineer in the San Bernardino office. He has three sons aged 19, 5, and 1, and a daughter aged 15.

Harold S. Endicott is assistant engineer at General Electric in Pittsfield, Massachusetts, engaged in work on high frequency dielectrics. Has twin sons 18 years old.

Capt. Bernard G. Evans is now with the Marine Aviation Detachment, Naval Air Technical Training Center, Jacksonville, Florida, in an administrative capacity. He has a 15-year-old son.

Charles E. Fitch is an Associate Patent Examiner for the U.S. Patent Office, and lives in Richmond, Virginia. He has two sons, 14 and 15 years old.

L. Dean Fowler has been engaged with the Industrial Division of General Electric Company in Los Angeles, and is now with the Oakland Works and District Headquarters at San Francisco. He has three daughters aged 5, 14, and 18.

Alva C. Hall is a Lieutenant in the U.S.N.R.

R. J. Hammond is Plant Staó Assistant in the office of General Plant Manager of the Southern California Telephone Co. in Los Angeles. His duties are in general staff supervision of all technical work involving interference and protection, and the war has given him more of the same sort of work. He has one 11-year-old son.

D. G. Harries, Jr. is employed in engineering and general administration work in the Pacific Tel. and Tel. Co. in San Francisco. He has a seven-year-old son.

George I. Hickey is with the Edison Company in Los Angeles, and is engaged in valuation cost work. He has an 11-year-old son.

D. G. Kendall is Field Engineer with the Square D Company in Los Angeles, and has two sons, 11 and 19.

George C. Kuffel is a micropaleontologist and lives at Long Beach, California. He has a 15-year-old son.

Howard B. Lewis is a consulting engineer and partner in the firm of Lewis-Larson Co. in Los Angeles. As usual he is full of new ideas to keep the wheels of industry rolling, and reports having sons, aged 19, 15, and 6 and daughter aged 0.

Donald H. Loughridge is a professor of physics at the University of Washington in Seattle, and is also engaged in war research. He has two sons, aged 15 and 20, and a daughter, 23.

Forest L. Lynn is more busily engaged than ever in teaching Electricity and Radio at the Institute of Electricity and Radio in Bakersfield, California. He has two sons, aged 13 and 6.

H. Todd Nies was engaged in patent work before the war, but is now in personnel work with Contractors, Pacific Naval Air Bases, Hueneme, California, as Manager, Employees Services.

John R. North is Assistant Chief Electrical Engineer with the Commonwealth and Southern Corp., Jackson, Michigan. He has 12 year old twins, a boy and a girl, and a 14 year old boy.

C. R. "Clancy" Owens has been with the General Electric Company since his graduation from Tech, and is the Pacific District Welding Specialist. He lives in Oakland, and has one son, 18, and two daughters 16 and 6.

J. H. Puls is the chief engineer in the production department, Pacific Coast Division of the Texas Company. He has a 9-year-old son and a 12-year-old daughter.

G. N. Ramseyer is still with the General Petroleum Corp. in Los Angeles, where he is Assistant Manager in the Operating Department.

Hubert A. Reeves was with General Petroleum Corp. in Geophysics Department for eight years following graduation from Tech. For the past twelve years he has been associated with his father in the publishing business and business manager of Western Plumbing and Heating. However, he has continued with research and consultation work to some extent. He has two sons, aged 13 and 15.

F. Fred Roberts is engaged in subdivision development and home building in

Tucson, Arizona. He has two sons, 14 and 16 years old.

L. P. Roth is President of Refrigeration Service, Inc., in Los Angeles.

R. J. Schonborn is an electrical engineer with Los Angeles City Bureau of Light and Power. Bob still reports no wife, no children.

Richard Seares was engaged in petroleum products transport and distribution before the war, and now has the added duties of strategic metals mining and transport. He is the development engineer for Signal Oil Co. in Los Angeles. Mr. Seares has a 9-year-old son and a 6-year-old daughter.

Elmer L. Smith is assistant engineer with the Municipal Water Dept. in Pasadena, and has an 18-year-old son.

Laurance G. South is contractor's manager with the William C. Crowell Company, a general contractor engaged in war housing. He has three daughters, 6, 12, and 14.

Charles C. Storms passed away several years ago, leaving his wife and two sons.

Perry Walker is an Engineer in the Plant Staff of Southern California Telephone Co. in Los Angeles. He has one son, aged 12.

L. A. Walling is Assistant Branch Manager of Sprinklered Risk Dept., Board of Fire Underwriters of Pacific. He has also been doing part time advisory work on army projects during construction. He has two sons, 11 and 14.

John P. Walter is Chief Engineer with Wintroath Pumps, Inc., and is engaged in deep well turbine manufacturing. He has one daughter, a year old.

Hubert Woods is Chief Chemical Engineer at the Riverside Cement Co., and has two sons aged 9 and 13 and a daughter 17.

Robert E. Woods is a geophysicist with the General Petroleum Co., and lives in Altadena, California. He has a 9-year-old son and a 17-year-old daughter.

1924

Loys Griswold is now living in Phoenix, Arizona, where he has been appointed Manager of the Phoenix branch of General Electric.

Major Edward D. Lownes is in charge of the construction of port embarkation in Seattle, fortifications of the Washington coast and Prince Rupert and Edward Islands, B.C.

Paul Stoker is attending the General Ordnance School, Navy Yard, Washington, D.C.

Lt. Col. William Lawrence Hall is now the commanding officer of a Coast Artillery Anti-Aircraft Battalion which has been assigned to protect one of the Southland's defense plants. He was recently promoted from Major and given this new assignment. Before entering the Army, Col. Hall was statistician for the Los Angeles City Engineer. His family lives in Pasadena, where Lawrence, his eldest son, is a freshman at Caltech and has enlisted in the Naval Reserve.

Fred Groat is with the Pan American Union in Washington, D.C.

1925

Oscar S. Larabee is a Lt. Col. in the Corps of Engineers, stationed in the Washington office of Air Engineer Headquarters of the Army Air Force.

Edward Cornelison has been the Civilian Training Administrator at the Sacramento Air Depot, and is now reported to be at Patterson Field, Ohio, on a similar job.

Tracy Atherton is now a 1st Lt. in the U.S.M.C.R. (A.V.S.) and has been stationed in the east.

Mick O'Haver is still with the Southern California Gas Co., and has been given a recent promotion, at present being the Divisional Sales Supervisor with headquarters in San Bernardino.

1926

J. Edward Kinsey is an instructor at U.S.C. in the evenings, teaching Safety Engineering.

Stewart Seymour is a Major in the Automatic Weapons Battalion of the Anti-aircraft Artillery. He is stationed at Riverside, California.

Frank H. Streit is on leave from his job as Senior Electric Engineer with the Hawaiian Electric Company, Honolulu, and is visiting in Southern California.

John E. Michelmore is Division Engineer with the Southern California Gas Company, Glendale office.

Charlie Bidwell and **George Moore, '27** are still with the Bell Telephone Laboratories in New York.

1927

Alan Capon is with the City of Burbank, working on the engineering staff of their steam power plant.

George R. Kaye is with the Union Oil Company in Seattle handling fuel oil and asphalt distribution.

Dave Shuster is with Bethlehem Shipbuilding at Quincy, Massachusetts.

Gleb A. Spassky is employed by the U.S. Engineer Dept., Pan American Highway, San Jose, Costa Rica. For the past three months he has been engaged in culvert and bridge location in the field, road drainage design, and has acted as coordinator between Bridge and Road Design Sections.

Wayne Rodgers is a Major in the Army Engineers and is in charge of the Maps Supply Division at the Pentagon Building, Washington, D.C.

Thurman S. Peterson is a Civil Service employee of the U.S. Navy, on duty in Seattle for the duration.

1928

Elbert Miller is chief engineer at the Fleetwings Aircraft Co. in Trenton, New Jersey.

John G. Gilbert is with the Texas Company.

Ralph Cutler is Chief Engineer of the Los Angeles Division of Western Pipe and Steel Company.

Alex Clark is engaged in oil exploration work in Alberta, Canada.

Frank Noel is Assistant Highway Engineer with the California Division of Highways, Los Angeles. He passed the November, 1942, examination for Licensed Civil Engineer, State of California.

Bill Mohr was promoted to a Lieutenant Colonel in the Corps of Engineers and is now on duty at the Desert Training Center in California.

Les Scott was promoted to a Major in the Corps of Engineers and commands a battalion in the Second Army.

1929

Thomas H. Evans is in the Army, and is working at the Pentagon Building, Washington, D.C.

George Weismann is now located at the Naval Air Base at Alameda, California, where he is a Lieutenant (j.g.) occupying the official capacity of an executive officer. His wife and family are with him.

Frederick R. Cline has been working on Pan American Highway, San Jose, Costa Rica, as Assistant Chief Engineer.

Al Cramer is still with the James Graham Mfg. Co., and that company's principal work is the rehabilitation of damaged naval aircraft for the U.S. Naval Air Base at Alameda. The company also holds contracts for a large quantity of OCD Stirrup Pumps. After being alone for seven months, he now has his wife and family located with him in Palo Alto.

Walt Grimes is now on duty with the Army Engineers in Australia and is a Lieutenant Colonel.

1930

Roland Hawes is with the National Technical Laboratories in South Pasadena.

1931

Thomas Robert White participated in the Tokio raid.

Lt. (j.g.) R. F. Labory, U.S.N.R., attended the training school for Naval officers at Ft. Schuyler in New York, and at present is with the Bureau of Ordnance at the Navy Department in Washington, D.C.

Herb Ingham, Rea Axline and **George Lufkin, '29,** are the Metallizing Engineering Company of New York. Rea is President, Herb Vice President and Chief Engineer, and George is Vice President and Treasurer.

George Liedholm is with Shell Development Company in New York City, and lives in Scarsdale, New York.

Larry Ferguson expects to finish his training at Penn State College where he is an Ensign in the U.S.N.R., and hopes to see duty in the Pacific.

DeWolfe Murdock is living at Ventura, California, and is employed by the contractors, P.N.A.B. at Port Hueneme Naval Advance Base Depot. He spent a year and a half at Midway Island, and saw the bombing of Pearl Harbor.

Walter Dickey is now a lieutenant in the Navy, and was at Midway during the battle.

1932

John V. Chambers has left the staff of Lybrand, Ross Bros. and Montgomery to accept a position as Assistant Administrative Manager of Marinship Corporation. However, the alumni is still represented in L.R.B. and M. by **Howard W. Finney, '32,** who remains on the Los Angeles staff of the firm.

Phil Schoeller spent three years in Hawaii as project engineer, and was at Pearl Harbor during the attack. He is now with the Bechtel Company in San Francisco.

Robert B. Freeman is the Assistant Plant Metallurgist at the Columbia Steel Co., Pittsburg, California.

1933

J. Stanley Johnson and Mrs. Johnson are the parents of a second son, Donald Pitkin, who was born March 29 in Pasadena.

Samuel Y. Johnson is a Lieutenant (j.g.) with the U.S.N.R.

Arnold P. Wilking, a Lieutenant (j.g.), is with the Inspector of Naval Material at Houston, Texas.

Dana E. Washburn has been on active duty with the U.S. Navy since September, 1941, and is now at Pearl Harbor.

Al Libby is the father of a son, Michael, born May 22, 1943.

Captain Robert G. Macdonald, has been in the Southwest Pacific for 18 months with the Engineer Corps.

Cedric Stirling is now a Lieutenant Commander and completed a course in aeronautical engineering in June from Caltech.

1934

William S. Everett, a Lieutenant (j.g.), U.S.N.R., is a Navy material inspector in San Francisco.

Nick Ugrin is a Lieutenant (j.g.) in the U.S.N.R.

Glen Woodward is an Ensign with the U.S.N.R. indoctrination at Quonset Point, Rhode Island.

Donald Rooke, a Lieutenant (j.g.) with the U.S.N.R., is with a Sea Bees Construction Unit in the South Pacific area.

1934

Dr. R. S. Crutchfield has devised a new type of survey of public opinion which is now being tested through several leading universities throughout the country. The survey is designed, not to "poll" the people of the United States, but to give them an opportunity to express their opinions and hopes about the war and the future.

James Radford is now a Lieutenant Commander is the U.S.N.R. and is at Washington, D.C.

Ray Kidd has been attending the Ft. Schuyler Naval Training School.

James N. Gregory is engaged in oil exploration in Alberta, Canada, as exploitation engineer.

Ernest R. Howard and Mrs. Howard are the parents of a daughter, Carol Jean, who was born April 26.

Willis Donahue is employed by the General Petroleum Corp. in the San Joaquin Division in connection with the conservation, production, and consumption of natural gas. He also keeps meters repaired and looks after miscellaneous compression equipment.

G. P. Brockman is a Lieutenant (j.g.) and is serving as an aviation volunteer specialist somewhere in the Pacific.

1935

Herbert S. Ribner is an assistant physicist with the National Advisory Committee for Aeronautics at Langley Field, Virginia, doing theoretical work on aircraft stability and control.

Carl R. Estep is working at present as an instructor for the Signal Corps and is teaching radio theory and laboratory.

John Ritter is now serving overseas as a Lieutenant with the Navy Sea Bees. He is the father of a baby girl born April 5.

Adrian Gordon, visited Tech recently. Since his last visit he has seen a good deal of the globe, having been in military meteorology in England, Gibraltar, and Bermuda, climaxed by a year as RAF Second Leader in Iceland.

1936

Paul Jones is with the U.S. Army Engineers.

Walfred Swanson is with the U.S. Army Engineers as assistant to the Division Engineer, Pacific Division, and is located in Salt Lake City.

Charles Best is in the Air Corps and is stationed at Kearns, Utah.

Glen R. Carley is employed by the Naval Aircraft Factory, Philadelphia Navy Yard, and is in charge of the Instrument Development Section Laboratory with a Civil Service rating of Associate Physicist.

G. Russel Nance, who is now in the army, writes, "This un-named spot is a mere pile of coral in the middle of the Pacific—the typical hypothetical desert island that seafarers get stranded upon in fiction. We have some of the best food available, and all for the meagre sum of $21 per month. I have charge of one of the shops, and really have my hands full. When I get back, I'll be able to act as a specialist in aeronautical engineering for the company."

Frank Davis, who has been doing engineering flight testing for Vultee for several years, has recently been put in charge of aerodynamics and flight testing at the Vultee Field Division of Consolidated Vultee Aircraft Corp. He learned to fly at Pensacola with the Navy.

Al Creal followed up the Reserve Commission that he received while at Tech, and is now hunting Japs somewhere in the Pacific. He is a Major in the Marine Corps.

Charles B. Jordan is now employed at the Industrial Laboratory, Mare Island Navy Yard.

Leo J. Milan is employed by the Douglas Aircraft Co. Inc., at Long Beach.

1937

Richard T. Brice, now a Major, recently finished a nine weeks course at the Command and General Staff School, Fort Leavenworth, Kansas.

Richard Goodell is still employed by the Brown Geophysical Co. in Houston, and is at present working on an N.D.R.C. job at the University of Texas.

Mr. and Mrs. Gordon Bussard are the parents of a son, Gordon, born April 15 at Martinsville, Virginia.

J. Ridgely Leggett, an Ensign in the U.S.N.R., has terminated his work with the Hughes Aircraft Co., and in February finished his indoctrinal training at Fort Schuyler, New York. At present he is at Bowdoin College, and later will finish his special training at M.I.T.

Bill Elconin is with the Signal Corps at Ft. Monmouth, New Jersey.

Charles C. Woolsey is now working at Caltech as a research assistant.

1938

Leroy Bruce Kelly, an Ensign in the U.S.N.R., was married at Hartford, Connecticut, on May 1 to Miss Betty Beale of Pasadena.

George B. Holmes, Jr., who has been with Douglas for the past two years, was transferred in February to that company's plant in Oklahoma City to act as Supervisor of the Analysis and Reports Department of the Comptrollers Division.

Charles Heath, Jr., is now teaching in the Mechanical Engineering Department of Rutgers University.

Roger H. Cowie is an instructor of physics at the Oklahoma A. & M. College. He is the father of a son born last November.

William T. Cardwell, Jr. is the father of a son, William T. Cardwell, III, born in March.

Gardner P. Wilson is a member of Western Electric Company's Radio Division and is employed as an electronics or Radar Engineer. He is in charge of a group of 10 engineers doing liaison work between the Bell Telephone Laboratories and the Western Electric Field Engineering Force. He lives in Summit, N.J.

1939

Frank McCreery, Jr. is now the Chief Engineer for Rohr Aircraft Corp., San Diego.

Lt. Charles F. Carstarphen was married on May 22 to Miss Susan Wilcox at Portland, Oregon.

W. D. Merrick is now in the chemical engineering department at the Institute after having spent several months in the British Isles.

Carl Paul announced the arrival of Carlton Hutton Paul III on Tuesday, March 23, at St. Francis Hospital, Peoria, Illinois.

1940

Robert Gewe is employed by the P. J. Walker Company, contractors for the Aluminum Company of America in Torrance, and other firms.

Jules Mayer and Miss Helen Doris Hoover were married March 27 in Los Angeles.

Walter R. Larson is a Captain in the Air Corps at Bainbridge, Georgia.

Dumont Staatz was married last October to Miss Marion Baker of Pontiac, Michigan, and he is now a senior medical student at the University of Michigan where he expects to graduate in October.

Robert Brumfield and Miss Marian Johnson have announced their engagement, and plan to be married in August. Bob will receive his doctor's degree in June.

Harold S. Mickley is attending the Massachusetts Institute of Technology.

Lt. C. S. Palmer, Jr. graduated in March from the Army Air Forces Technical School at Yale University.

Major P. M. Honnell is with the Department of Chemistry and Electricity at the U.S. Military Academy at West Point.

John Billheimer and Miss Elizabeth Spencer were married on March 27 and are living in Minneapolis where they both are taking graduate work at the State University. John also holds a position as efficiency expert with a powder concern.

1941

John W. Gillings is now at Ft. Monmouth, New Jersey, after having spent several months in England doing electronics work for the army.

James W. Whittlesey has moved from Hollywood to 3504 NE U.S. Grant Place, Portland, Oregon.

Grant W. Ewald has been transferred from the West Virginia Ordnance Works to the Delaware Works of General Chemical Company in Wilmington, Delaware.

Capt. Frank Casserly of the Marines has recently returned from England, and spent a few days in Pasadena during June. He is stationed on the east coast.

Frank Skalecky and **Bill Menard**, '42, joined together in the U.S.N.R., attended the same intelligence school at Washington, and since that time have spent their "leisure" on a south sea island.

William Schubert, a Lieutenant (j.g.) has been attending the U.S. Naval Engineering Experiment Station at Annapolis.

1942

Harry (Sam) Madley and Miss Lois Norman of San Marino, were married on April 17, and are now in the east where Sam is an Ensign with the U.S.N.R. at Fort Schuyler, N.Y.

Al Landau is an instructor in light anti-aircraft fire control at the Aberdeen Proving Grounds. He holds the rank of Technical Corporal.

Dave Berman is the father of a son, Jerald Dennis, born February 12. Dave is with the Goodyear Tire and Rubber Co. in Los Angeles.

Gordon K. Woods and Miss Leona Jakobsen were married on April 25 at Palo Alto, and they are now living in Berkeley. Gordon is employed by the Kaiser Co. in Richmond.

Chang-nee Tsu and Miss Doris Chao were married in Pasadena on June 5. Both were born in Shanghai and received their early schooling in China, but they met in Pasadena. Mr. Tsu is an aerodynamicist with an aircraft company.

Kenneth Schureman, Ensign (CEC) U.S.N.R., was put on active duty immediately after his graduation from Tech. After a short training at Norfolk, Virginia, he was sent to the Navy Yard Annex at Bayonne where he worked for the Offices in Charge of Construction of the Supply Depot and Dry Dock. He is now attached to the Public Works Department.

Eric H. Schauer is a design engineer for Central Metal Products, Los Angeles.

Warren Gillette has been attending the Midshipmen Training School in Manhattan.

Paul Allen is now located at the Office of Inspector of Naval Material for the Los Angeles District. He was married on February 7 to Miss Nancy Momson of Fresno.

Frank W. Wood was graduated on May 31 with the Maintenance Engineers Class from the Technical School, Army Air Forces Training Command at Yale University, and now holds the rank of Lieutenant.

LETTERS TO THE EDITOR

Donald S. Clark, Editor
Alumni Review
California Institute of Technology
Pasadena, California

Dear Don:

The article "Commercial Broadcasting" by Beverly Fredendall in the March issue of the Alumni Review contains implications of wire line frequency range limitations which do not exist on lines leased from the Bell System by the broadcasting companies.

The chart on page 7 shows "Good broadcast studio and transmitter," 16 to 16,000 cycles; "Wire circuit to local transmitter," 16 to 8200 cycles; and "Transcontinental wire circuit," 80 to 5200 cycles. This incorrectly implies that limitations imposed by wire circuits prevent reception by broadcast listeners of the full frequency range of which broadcast equipment is capable. This implication is repeated in the text on page 19.

As a matter of fact nation-wide wire circuits covering the range 50 to 8000 cycles are available on order and, for limited distances, channels capable of transmitting frequencies from 20 to 20,000 cycles are available. Furthermore, wire lines with higher frequency limits have been used on several occasions, as for example those used for transmitting television frequencies up to about 3 megacycles. In short, wire circuits are available or in normal times would be made available to cover any frequency range ordered by the broadcasting companies.

Although some readers may not realize it, I am sure that Bev does not intend to imply that technical considerations limit the frequency band width which wire lines transmit. On page 19, following the statements of limitation of frequencies transmitted by wire, Bev points out that the upper frequency limit is restricted by several other factors, chiefly by the need to prevent inter-channel interference, and by radio receiver circuits and loudspeakers. To the careful reader it will be obvious that these other limitations make it largely unavailing to transmit wide frequency bands on many transcontinental circuits. However, the casual reader or the person looking at the chart but not reading the text very likely would be given the incorrect impression that wire line transmission prevents full enjoyment of broadcast transmission. Actually wire lines are available and in use whose capabilities exceed that of the "Good broadcast plant" referred to by Bev on page 19.

I am sure I am expressing the thoughts of all members of the Alumni Association in saying that we appreciate Bev's providing this article and I am confident that Bev will welcome the thoughts expressed here as endeavoring to remove any misapprehensions which may have resulted from lack of emphasis on the actual limitations upon transmitted frequency band width.

Yours very truly,

H. K. Farrar,

Transmission Engineering Dept.,
So. Calif. Tel. Co.

Donald S. Clark
Editor, Alumni Review
California Institute of Technology
Pasadena, California

Dear Don:

I am in substantial agreement with the basic thought expressed by H. K. Farrar of the Southern California Telephone Company regarding the article "Commercial Broadcasting." In this article it was not my intention to imply inability of the telephone companies to provide wire circuits having a greater frequency range than that in use today and correctly pictured on the published chart, but rather to give an explanation of current practice as used in network operation at the present time in terms everyone could understand.

In a similar manner the picturization of the limited frequency range of the present day radio sets as shown in the same chart was not an indication of the inability of engineers to design radios of greater frequency range. Proof of this ability is evidenced by present day television receivers. It was an attempt, however, to show the average radio set as it exists today.

Perhaps more emphasis should have been placed upon the basic reason for the limited frequency range of present day radio sets and in turn upon the economic use of a comparable frequency range wire circuit. The primary reason for the limited high frequency range is due to the crowded condition of the present broadcast band where adjacent channels are only 10,000 cycles apart. Being only 10,000 cycles apart means that under certain conditions, usually associated with long distance reception, when the listener attempts to tune in a "desired" station and finds that on an adjacent channel there is an "undesired" station, that the program of one crosses over into and causes interference with the other. For example, a 4,000 cycle tone on one channel would be received as a (10,000—4,000) 6,000 cycle tone on the other. Similarly a 7,000 cycle tone on one channel would become (10,000—7,000) 3,000 cycles on the other. This form of interchannel interference results in the inversion of sound, with respect to 10,000 cycles (the channel separation), as the program crosses from one channel to an adjacent one. Since this inverted sound is unintelligible it is popularly called "monkey chatter."

The entire subject is too technical for full treatment here, but in short, interchannel interference is reduced by limiting the upper frequency range of radios used for long distance reception applying under present broadcast conditions.

Very truly yours,

Beverly F. Fredendall