

2YA, WELLINGTON (720 KILOCYCLES)—SUNDAY, JANUARY 5, 1930.

- 8.0 : Afternoon session—Selected gramophone items.
 4.30 : Close down.
 6.0 : Children's song service, conducted by Uncle George.
 7.0 : Relay of service from St. Andrew's Presbyterian Church. Preacher, Rev. R. Howie, B.A. Organist and choirmaster, Mr. Frank Thomas.
 8.15 : (approx.) Studio concert by the Port Nicholson Silver Band, under the conductorship of Mr. J. J. Drew, and assisting artists.
 Hymn—Band, "Roseate Hues" (Hume).
 Selection—Band, "Down South" (Myddleton).
 Soprano—Mrs. Amy Dunn, "Jerusalem" ("St. Paul") (Mendelssohn).
 J. H. Squire Celeste Octet, "Memories of Mendelssohn" (arrgd. Sear).
 Baritone—Mr. Ernest Short, "Glory to Thee, My God, This Night" (Gounod).
 Cornet solo with band accompaniment—Bandsman T. Goodall, "Titania" (Rimmer).
 Contralto—Miss Hilda Chudley, "For Ever and a Day" (Mack).
 Selection—Band, "Old English Sea Songs" (Bailey).
 Soprano—Mrs. Amy Dunn, (a) "Ave Maria" ("Cavalleria Rusticana") (Mascagni); (b) "Lilies" (Barry).
 Vocal duet—Gladys Cole and Barrington Hooper, "Speak to Me of My Mother" ("Carmen") (Bizet) (Zonophone G087).
 Egyptian serenade—Band, "Amina" (Lincke).
 Baritone—Mr. Ernest Short, (a) "Give a Man a Horse He Can Ride" (Thomas); (b) "Tally Ho" (Leoni).
 Organ—F. Rowland Tims, F.R.C.O., (a) "At Dawning" (Cadman); (b) "Shepherd's Lullaby" (Hewitt) (H.M.V. B3021).
 Contralto—Miss Hilda Chudley, (a) "Let Miss Lindy Pass" (Rogers); (b) "The Wind Song" (Rogers).
 Selection—Band, "Prelude" (Rachmaninoff).
 Vocal duet—Bessie Jones and Barrington Hooper, "Now I Will Dance but to Please Thee" ("Carmen") (Bizet) (Zonophone G087).
 March—Band, "Invercargill" (Lithgow).
 Close down.

3YA, CHRISTCHURCH (980 KILOCYCLES)—SUNDAY, JAN. 5, 1930.

- 8.0 : Afternoon session—selected gramophone items.
 5.30 : Children's song service (children of the Methodist Sunday Schools).
 6.15 : Hymn tunes from studio.
 6.30 : Relay of service from St. Alban's Methodist Church, Rugby Street.—Preacher: Rev. L. B. Neale. Deputy Organist: Mr. Sydney Jones.
 7.45 : Studio programme:
 Overture—San Francisco Symphony Orchestra, "Midsummer Night's Dream" (Mendelssohn) (H.M.V. D1626-7).
 7.57 : Soprano—Miss Sylvia Angus, "Beyond the Dawn" (Sanderson).
 8.1 : Male choir—Don Cossacks, "Three Folk Songs" (arrgd. Dobrowsen).
 8.5 : 'Cello—Mr. Francis E. Bate, "Lamento" (Gabriel Marie).
 8.10 : Baritone—Mr. Leslie Fleming, "Ideale" (Tosti).
 8.14 : Organ—Edouard Commette, "Fantasie in G Minor" (Bach).
 8.22 : Instrumental Trio—Misses Gladys Vincent and May Garden and Mr. Frances Bate, (a) "Extase" (Gaune), (b) "Serenade" (Haydn).
 8.31 : Contralto—Mrs. Nellie Whitworth, "Christmas Bells" (Liddle).
 8.35 : Choir—Berlin Union of Teachers, "The Lorely" (Silcher).
 8.39 : Piano and orchestra—Karol Szreter and Berlin State Opera Orchestra, "Hungarian Rhapsody No. 2" (Liszt), (Parlophone A4109).
 8.47 : Soprano—Miss Sylvia Angus, (a) "Life" (Curran), (b) "The Almond Tree" (Schumann).
 8.53 : 'Cello—Mr. Frances E. Bate, "Menuet" (Boellmann).
 8.57 : Baritone—Mr. Leslie Fleming, (a) "Route Marchin" (Stock), (b) "Dream Tryst" (Cadman).
 9.3 : Boys' Choir—Hofburg Chapel, Vienna, "Joy, Queen of the Wise" (Mozart) (Parlophone R20021).
 9.7 : Instrumental trio—Misses Gladys Vincent and May Garden and Mr. Frances Bate, "Trio in F—Allegro and Animato" (Gade).
 9.16 : Contralto—Mrs. Nellie Whitworth, (a) "To a Nightingale" (Brahms), (b) "True Love" (Brahms).
 9.22 : Chorus and orchestra, Berlin State Opera, "Aida—Triumphal March" (Verdi) (Parlophone R20018).
 9.30 : Close down.

4YA, DUNEDIN (650 KILOCYCLES)—SUNDAY, JANUARY 5, 1930.

- 8.0 : Town Hall chimes.
 8.1 : Selected gramophone items.
 5.30 : Children's song service, conducted by Big Brother Bill.
 6.30 : Relay of service from Knox Presbyterian Church.—Preacher: Rev. L. McMaster, B.D., of Christchurch. Organist: Mr. C. Roy Spackman.
 7.55 : Weather report.
 8.5 : Relay from Band Rotunda, St. Kilda, of concert by the St. Kilda Band.
 9.15 : Close down.

Moving-Coil Speaker Manufacture

An Interesting Process

IN this modern age of mechanical achievement we are inclined to take everyday machinery and apparatus for granted rather than pause a moment and consider in detail its complicated construction. An interesting case in point is the modern dynamic loud-speaker, and the following description of the manifold and intricate details involved in its construction is both interesting and enlightening.

The initial operation in the construction of these speakers is the shaping of the field cases. This is accomplished by means of complicated and powerful presses which bend and shape stout steel casing as easily as a child moulds clay. It is essential that these machines should be accurate to a hair-breadth, for even a slight variation in the field casing would produce a great variation in the "driving force," and thus a tremendous distortion in the sound from the speaker.

In the construction of many of the parts the raw materials are fed to a line of machines, each of which has its own particular operation to perform, and thus finally the completed speaker part is produced. For example, the cone housings pass through the many operations necessary—the blanking of the steel, the forming operation, and finally by many stages to the last, precise blow that makes them just the right height, the right diameter, and the correct angle.

The manufacture of a completed speaker from raw materials necessitates over 200 inspections, as carried out in the Magnovox factory. An inspection takes place after every machine operation, and in addition there are many inspections during the assembly of the unit. One of the most interesting phases of the manufacture lies in the automatic lathes, which turn, cut, drill, tap and finish cores without a workman near.

The problem of dynamic speaker design is a fascinating one, and explains why some speakers are superior to others, though all are operated on the basis theory. In a theoretical dynamic speaker the diaphragm would be massless, of infinite size, totally rigid, and would operate without friction and with no load except the resistance of the air. In addition, there is the problem of keeping the electrical factors constant. A speaker should furnish a pure resistance load equal to twice the output valve impedance. These, and other theoretical specifications, which practically are impossible to adhere to, are ingeniously overcome by designers of dynamic speakers by making the errors compensate for each other.

Though it is impossible to obtain a weightless diaphragm, it can be ap-

proximated by the use of a light paper cone which is both strong and rigid. The weight is compensated for by suspension. Similarly, other irregularities in design are corrected by further compensating factors.

The most important object to be attained in dynamic speaker manufacture is, of course, perfect reproduction. This is governed by many factors, chief among which is the strength of the field coil, which is determined chiefly by the dimensions of the air gap in which the moving-coil operates.

The whole design and construction of Magnavox dynamic speakers is the result of many years of research and experimentation; seldom do people pause to appreciate the wonderful background of inventive and creative reasoning that lies behind these everyday appliances which we buy in a store, set on the table, and then forget about, except to enjoy their performances.

Radio Communication for Aeroplanes

Development in America

BOTH aviation and radio interests are now fully alive to the need for better radio communication facilities for aeroplanes, whether engaged commercially or privately. In this respect America lags far behind Europe, but recently much interest has been displayed in that country, especially by air transport companies, in radio as an aid to air navigation.

Many air transport companies have now installed two-way communication in their planes, while many well-known radio engineers are experimenting with a view to improving the special type of apparatus used. An aeroplane was recently purchased by the Radiomarine Corporation to assist in the development of aircraft radio apparatus. It is proposed to tour America in this plane and demonstrate to those interested the newly-designed equipment which the plane carries.

Most of the radio apparatus has been compactly assembled on a light but rugged duralumin frame fastened in the fuselage. This equipment includes two transmitters deriving their power from a wind-driven generator, and two receivers, one of which is intended for use with special short-wave stations. The other is a beacon receiver to enable the plane to keep on a given course in any weather. The latter receiver is mounted in the tail of the plane, and is operated by remote control. The aerial consists of a short copper rod which extends about six feet above the fuselage.

High-Powered American Stations

(Continued from last week.)

WNBR—Memphis, Tennessee—500 watts	200	1430
*WOV—New York City, New York—1 kw.	265	1130
*WOW—Fort Wayne, Indiana—10 kw.	258	1160
WTAD—Quincy, Illinois—500 watts	208	1440
*WTAM—Cleveland, Ohio—3½ kw.	280	1070
KVOO—Tulsa, Oklahoma—5 kw.	263	1140

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