

- 9.7 : Instrumental—Christchurch Broadcasting Trio. (a) "Minuet in E Flat" (Beethoven), (b) "Slavonic Dance No. 3" (Dvorak).
 9.17: Baritone—Mr. A. G. Thompson, (a) "I Gave You Roses" (Aylward), (b) "Best of All" (Raymond Leslie).
 9.24: Suite—Royal Opera Orchestra, "Peer Gynt Suite" (Grieg). 1. Anitra's Dance. 2. In the Hall of the Mountain King. (H.M.V. C1299).
 9.30: Close down.

4YA, DUNEDIN (650 KILOCYCLES)—SUNDAY, FEBRUARY 2.

- 3.0 : Town Hall chimes.
 Selected gramophone items.
 5.30: Children's song service, conducted by Big Brother Bill.
 6.30: Relay of service from First Church. Preacher: Rev. Dr. Hunter. Organist: Dr. Galway.
 7.45: Instrumental—New Queen's Hall Orchestra, "Petite Suite De Concert" (Coleridge-Taylor) (Columbia 02588-89).
 8.1 : Bells, organ and choir—"Easter at St. Margaret's, Westminster."
 8.7 : Pianoforte—Mark Hambourg, "Hungarian Rhapsody No. 14" (Liszt).
 8.15: Relay of studio programme from 3YA Christchurch.
 9.30: God Save the King.

Tips and Jottings

Insulating Screw-Drivers.

IT is frequently necessary to make slight adjustments within a radio set when it is in operation. It is common practice to use a screwdriver for this purpose, but, even in the hands of an expert, this may cause a short circuit that will result in burned-out valves. To prevent this, the screwdriver should be insulated, and there are three ways of doing this effectively: The first and simplest consists in carefully covering all but the edge with insulating tape; the second is to slip a length of rubber tubing over the metal shank, and the third, for small screwdrivers, is to use spaghetti.

Securing Bolts in Position.

BOLTS and screws which work loose can cause a lot of annoyance. The bolts which hold components to the panel, and the screws which fix the panel to the baseboard do not usually tend to work loose, but the grub screws in the dials of variable condensers and the nuts on the ends of moving spindles (in stud switches, for example) are sometimes troublesome in this way. An easy method of dealing with this is to dip the offending nut or bolt in shellac varnish before putting it in position. The shellac should be quite thick; if a small amount is exposed to the air in a saucer for a few minutes, some of the solvent will evaporate and the varnish will become "tacky." It will then be of the correct consistency for the purpose. If any difficulty is experienced in removing the nut or bolt subsequently, the tip of a hot iron applied to it for a moment will free it.

Adjusting Screened-Grid Voltage.

QUITE a large number of receivers employing one or more stages of screen-grid radio-frequency have some means of making critical variations to the voltage applied to the screening grid. Sometimes a separate tapping is provided, and this is satisfactory if small voltage steps can be made on the B battery or eliminator. Another good scheme, though, is to place a variable high resistance in series with the screening-grid connection. A maximum value of 50,000 or 100,000 ohms is advisable, and the junction point of the resistance and the screen should be earthed with a condenser, 2 microfarads being a suitable value. The great point about this little control system is that you can alter the work-

ing characteristics, and, indeed, the internal resistance, by varying the screening-grid voltage. The effect of thus varying the "inside" of the valve is the same as with ordinary three-electrode valves. The actual amplification depends on the ratio between the impedance of the anode circuit and the valve impedance, and in practice it is a great convenience to be able to have the valve-impedance factor under control. The normal B voltage used with most screen-grid sets is 100 to 150, and a 50,000-ohm resistance is sufficient to bring this down to the required value for average screen-grid valves.

Preparing Coil Formers.

SOME constructors find it rather difficult to cut off a length of cardboard or ebonite tubing neatly and straightly. The best way to set about the job is this: Make a small mark (use a scriber in the case of ebonite, and a pencil for cardboard) at the place where the cut is to begin. Measure the distance from this mark to an end of the tube, which is perfectly straight. Go round the tube, making a number of other marks at intervals at the same distance from the end of the tube as the first one. If these are fairly close together you will not have any difficulty in joining them so as to make a continuous guide line right round the tubing. Now place the tube on the bench and start the hacksaw carefully on the marked line. As soon as you have cut through the wall of the tube at this point turn the tube slightly in a direction away from the body. As the hacksaw blade should be set to cut on the thrust you can thus see that the teeth meet the guide line as they make the cutting stroke. Cut only with the "heel" of the blade, holding the saw so that the forward portion of the blade does not touch the material either on the thrust or on the draw. Continue to turn the tube whilst cutting until you have gone right round the guide-line. It will then be found that the cut has been made perfectly straight. The end of an ebonite tube should be trimmed up after cutting with a fine file; for cardboard tubing it is best to use a very sharp knife for the purpose.

Index of Technical Features

Volume III to Date

All 1929, unless "30," appears in parentheses after date.

A.C. Valve Protection	Oct. 4	Loudspeaker, Adaption of	
Audio Stage, Adding an	Sept. 13	Linen Diaphragm ..	July 28
"Beginner" Three-valve		Loudspeaker, An Improv-	
Set	Sept. 6, 13	ed Linen Diaphragm ..	Oct. 11
Browning-Drake, Aerial		Noises, Their Elimina-	
and Secondary Coils		tion	Sept. 13
for	Sept. 20	Parallel Feed, The effi-	
Browning-Drake, A.C.,		ciency of	Oct. 4
(Coil Considerations)	Oct. 4	Portable, "Tongariro" ..	Nov. 22, 29
Browning-Drake A.C.		Portable, Cutting Cur-	
Two-valve Tuner	Sept. 20	rent Consumption in ..	Nov. 19
Condensers, Blocking		Power Pack for 250	
(A.C. Resistance) ..	Jan. 17 (30)	Valves	Dec. 27 to
D.C. to A.C. Operation	Sept. 20		Jan. 10 (30)
Detector Unit, Anode-		Power Valve Output ...	Jan. 17 (30)
Bend	Aug. 16, 23	Power Amplifiers, A	
Eliminators, "ABC" ...	Sept. 20	Chat About	July 19
Eliminators, Direct Cur-		Power Amplifier, A.C. ..	Sept. 20
rent	Oct. 25	Power Valves, Their	
Fading, Principles of ..	Oct. 4	Choice	Sept. 20
Frame Antennae, Theory		Regenaformer, A New ..	Oct. 11
and Construction ..	Dec. 6, 13	Regulations, P. & T. (In	
Gramophone Pick-up ...	Aug. 2	Respect of Interfer-	
Grid Bias, for A.C. Re-		ence)	Sept. 13
ceivers	Sept. 20	"Screen-Grid Detector"	
Grid Bias, Obtaining		Two	Nov. 1
Accurate	Jan. 17 (30)	Speaker, Cone Construc-	
Heaviside Layer Theory	Sept. 6	tion of	Dec. 6
High Frequency Chokes,		Station Designations in	
Design of	Dec. 13	Kcs. and Metres	July 26
"Home-made" Three	Sept. 6	Stations, List of High-	
"Home-made" Three		powered	Dec. 20, 27
Refinements	Oct. 18	"Trampers' Two"	Nov. 29,
Inductance Coils	Aug. 23		Dec. 6
	Sept. 27	Transformer, Power (De-	
	Nov. 15	sign and Construction)	Dec. 20

Plug-in Coils

ON short-wave receivers utilising ordinary plug-in short-wave coils it is the increasing practice to fix the baseboard aerial coil-holder by one screw, allowing it to be moved to vary the coupling between the aerial and the grid or reaction coil. This enables "flat spots" on the tuning condenser to be obviated, and is more efficient than putting a condenser in the aerial lead. When removing coils, special care has to be taken owing to the fact that, fixed to one side only, the holder is likely to be pulled from the baseboard or the screw-hole broken. Also the coil is not always in line with the others when in a swivelling holder, as the one screw tends to pull the holder to one side. If a piece of celluloid, mica or similar insulating material is cut in a semi-circular shape and fixed with screws, to the baseboard over the unscrewed leg of the coil-holder the coil may still be swung round, but the holder is as firm as when fixed with two screws.

Aligning Gang Condensers

ALIGNMENT of gang condensers can be readily checked with a simple tool made from a 5in. piece of ebonite rod with a 1½in. heavy copper wire ring fastened to one end and an old condenser plate fastened to the other end. This tool may be used to add an extra plate to the moving plates of each condenser in the gang by placing its condenser-plate end in parallel with the fixed plates and touching the moving plates. If the signal then increases in strength, the condenser is low in capacity and its trimmer should be tightened. If the signal decreases in strength the condensers are approximately in alignment. After checking for low capacity, insert the ring end of the tool in the centre of each radio-frequency coil. This should decrease the signal strength. If the signal increases, the capacity is too high and should be lowered by adjusting the trimmer or bending the outside plate until a decrease in signal is experienced. The condenser-plate test should then be repeated so as to be sure that

Mullard
 THE MASTER VALVE

Embodies all improvements
 known to Valve Manufacturers.