

The Conn Electronic Organ

IN TWO PARTS—PART 2

RICHARD H. DORF*

Continuing the description of the "Artist"—one of a complete line of instruments which employ the separate-oscillator design in a flexible and thoroughly workable form.

UP TO NOW we have said simply that each note is keyed by applying a positive 75 volts to the oscillator plate. The actual conditions are complicated by the coupler system, whose function is to play more than one note when a single key is pressed.

When all couplers are in off position, pushing the C_1 key will supply plate voltage only to the C_1 generator and that will be the only one to sound. When playing on the Swell and the 4' rocker tablet at the left of the manual is pressed, both C_2 and C_4 will sound. With the $2\frac{2}{3}'$ tab pressed, G_4 will sound.

(This is approximately the third harmonic of C_2 , equivalent to a $2\frac{2}{3}'$ rank on a pipe organ.) This process continues with the remainder of the coupler tablets in the manner shown in the keying chart of Fig. 11.

Obviously, then, the keying circuits must provide for as many switches per key as there are registers and couplers, and for a method of making registers speak or remain silent at will. The mechanics of the system used by Conn are new and are shown to some extent by Fig. 12. In this photo, the manual in position is the Great; note the two

coupler tabs, SWELL TO GREAT 8' and GREAT TO GREAT 4' at its left. Above this, the Swell manual has been swung up to show the key switches on its underside; note that the white undersides of the swell keys can just be seen at the top.

There are six registers in the Swell, and for each there is one switch wire or finger. All fingers are molded in a lower plastic dowel (or rear dowel, as it would be with the manual in playing position). The fingers are also held in a second dowel which moves downward when a key is pressed (they move outward toward the reader with the manual up-ended in the photos). The movement of the dowel bends the fingers and causes the free end of each to contact one of the six keying rods which run lengthwise of the manual. These rods carry +75 volts. Since each finger is connected to an oscillator plate, the contact keys the oscillators.

Let us move at this point to Fig. 13 and look at the drawing of the Swell keyboard switches. The mechanism here is shown in playing position. A key pressing down on the actuator causes it to move downward as indicated by the arrow. It causes all the keying fingers to move down so that each finger touches the rod beneath it which is running at right angles to the fingers (through the page as viewed). Notice the peculiar cross-section shapes of the keying rods. Each consists of a metal extruded or drawn bar in a D shape with a projection from the straight part of the D. The thick black outline around everything but the projection represents an insulating sleeve. When the bare projection points up, a finger hitting it makes electrical contact. When the bar is rotated so that the projection points to the right, the finger strikes the insulating jacket and no contact is made. The bars are rotated by the rocker coupler tablets at the left of the manual, so that the position of a tablet determines whether its bar shall or shall not contact its row of fingers. The bar rotating mechanisms, six of them for the Swell, are plainly

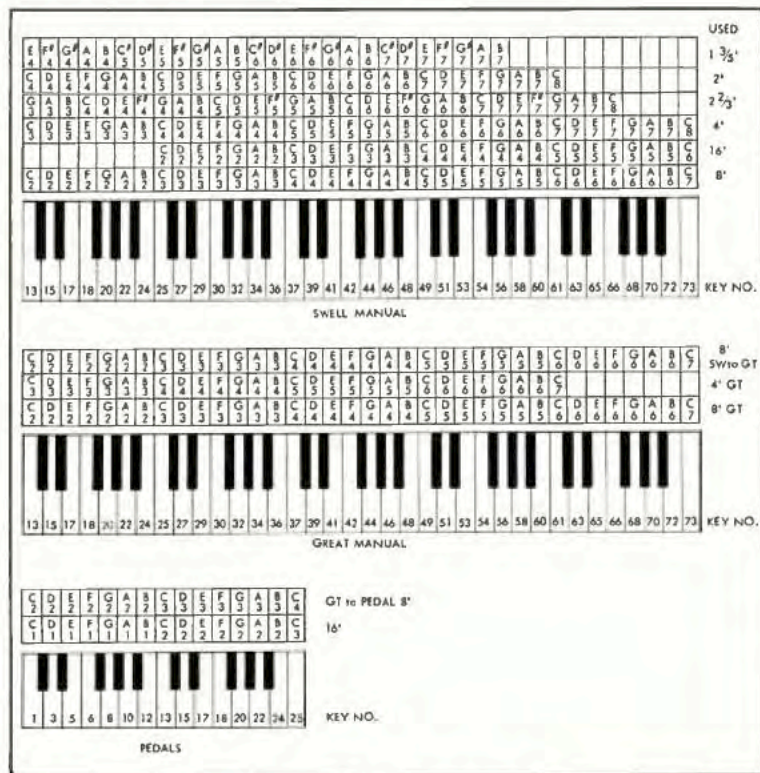


Fig. 11. Interconnections of the coupler circuits in the three sections, simplified by labeling only the white keys.

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Circle 87A

AUDIO • OCTOBER, 1956

ELECTRONIC ORGAN

(from page 56)



Fig. 18. Electronically regulated power supply and the preamplifier occupy the same chassis and provide interconnection between components.

eventual difficulty with noise which is found with almost every type of pedal-operated potentiometer. The chassis which holds the preamplifier and the electronically regulated power supply for the entire console may be seen on the floor of the console shell in Fig. 6 and in a close-up in Fig. 18. The expression control is the radio-type variable capacitor seen on the right end of the chassis in the latter figure; the swell shoe is connected to it mechanically so that operation of the shoe rotates the rotor.

The variable capacitor is part of a capacitive voltage divider. The shunt leg of the capacitive divider is the capacitive input of the 6AU6 stage with capacitive feedback. The 150-µf fixed capacitor feeds signal of opposite phase from the 6BF6 cathode circuit so that at minimum setting of the variable capacitor a bucking or bridge balance condition is approached. This bucking gives the circuit a greater range of control than the ratio of minimum to maximum capacitance that the variable capacitor would otherwise provide. The 6AU6 feedback

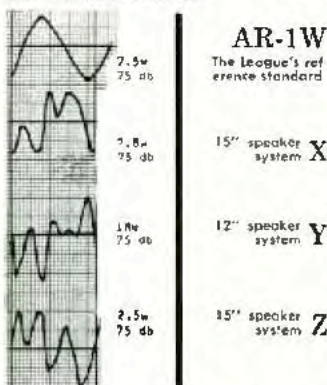


Fig. 19. "Tone Cabinet"—loudspeaker system with self-contained power amplifier—suitable for home use.

AR-1

Report from the
LABORATORY
*The Audio League Report**

Fig. 5
Acoustic Output at 30 CPS



*Vol. 1 No. 9, Oct., '55. Authorized quotation #26. For the complete technical and subjective report on the AR-1 consult Vol. 1 No. 11, The Audio League Report, Pleasantville, N. Y.

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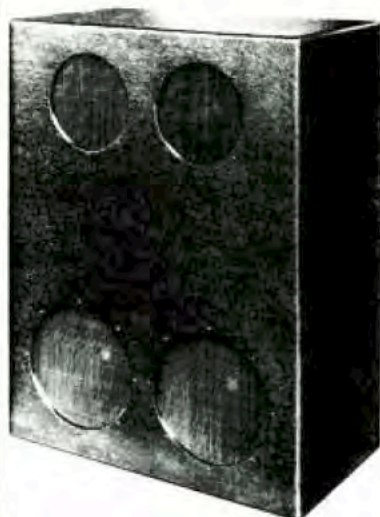


Fig. 20. Designed for installation in concealed location, this utility tone cabinet is equipped with a 40-watt amplifier.

capacitor is multiplied in value by the gain of the stage and this lowers the grid-circuit impedance so that a recommended value of grid resistor may be used without loss of 32-cps signal. Output of this stage is fed through cables to the speaker units.

Three loudspeaker units or tone cabinets are available for use with the Artist model, though qualified people can sometimes make installations with nonstandard speakers. The Model 110 unit, shown in Fig. 19 contains a 15-inch woofer and a 10-inch "tweeter," with a 20-watt power amplifier. Sound radiates upward. Model 119 has the same specifications but has a utility finish for concealed locations and propagates sound horizontally. The Model 159 unit, shown in Fig. 20, also in utility finish for concealed locations, has two 15-inch and two 10-inch speakers, with a 40-watt amplifier. Any number or combination of speaker units can be used, depending on the location, since each contains its own power supply and its signal input is simply bridged across the output line from the console.

SEMICIRCULAR HORN

(from page 29)

Rigidity sufficient to completely eliminate horn wall sound absorption (i.e., zero vibration and 100 per cent reflection is hard to achieve. Costs, ease of assembly, volume, and final weight dictate the use of reasonably priced and readily worked, semi-light materials, usually 3/4-in. plywoods. Concrete or sand-filled walls have been recommended but are hardly attractive. Phelps¹⁴ found attenuation of several db in wood walls partly reducible by heavy shellacing.

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