

# Duoforte 45E

The Duoforte 45E is a combined Radiola and Phonograph designed for use as a broadcast receiver and for the electrical reproduction of recorded music.

The chassis is identical with that of the Radiola 45E. The electric phonograph consists of a record turntable driven by an induction type motor, and an electric pickup together with speed and volume controls.

For information regarding the servicing of a Duoforte 45E chassis, refer to the section of these notes covering the Radiola 45E.

In the event of trouble with the phonograph section of the instrument, the following circuits should be examined and tested.

Pickup Winding.

Pickup Leads.

Volume Control.

Primary Winding of the Audio Transformer.

Secondary Winding of the Audio Transformer.

The phonograph input cable to the chassis.

The windings and power cord of the electric motor.



# Radiola 45E

## Model C 79

190-270 Volts, 50-60 Cycles.

190-250 Volts, 40 Cycles.

### GENERAL DESCRIPTION.

The Radiola 45E is an electrically operated single control screened grid receiver, consisting of two stages or screened grid radio frequency amplification, a screened grid linear power detector, and one stage of audio amplification.

The grid circuits of the screened grid radio frequency stages and detector are tuned by a three gang condenser unit. The circuits are efficiently shielded, and provided with individual bypass condenser units mounted under the chassis. These features minimise "feed back" and provide an efficient and stable radio frequency amplifier.

By using a high gain radio frequency amplifier, together with a screened grid linear power detector, a large audio input to the power valve is provided, together with good selectivity and fidelity.

The audio stage consists of a UX245 power valve choke coupled with a specially designed high inductance "Ideal" choke, together with a coupling condenser and a grid resistor.

As the Radiola 45E has only one stage of audio amplification, the detector is used as an audio frequency amplifier for phonograph reproduction. For use as a phonograph the "pick-up" is introduced in the grid circuit of the detector valve, and the bias resistor is paralleled with a second resistor to give the correct bias for operation as an audio amplifier. During Radio reception the pick-up jacks are short circuited and the second bias resistor open circuited by the "R-P." switch.

The volume control is an A.W.A. wire wound potentiometer which varies the voltage on the screening grids of the radio frequency amplifying valves and thus controls the radio frequency input to the detector valve.

The Radiola 45E is fitted with a Local-Distance switch in the aerial circuit to reduce the input to the receiver when listening to strong local stations.

The Radiola 45E is specially designed to make provision for the alternate use of either a magnetic or an A.W.A. Moving Coil loudspeaker. The chassis includes a moving coil speaker step down transformer, a magnetic loudspeaker coupling condenser, and a moving coil speaker field supply compensating resistor. When using a magnetic speaker, or a dynamic speaker with an independently excited field, connection is made to the loudspeaker pin jacks on the Radiola chassis.

A.W.A. "Moving Coil" loudspeakers are fitted with a 4 pin plug and cable which connects to the power unit by inserting in the UX socket provided on the back of the chassis. The field winding of the loudspeaker is connected across the "grid" and "plate" pins and the "Moving Coil" of the speaker across the filament pins.

A field compensating resistor is provided in the power unit which automatically comes into operation when the 4 pin plug is removed. This resistor is equivalent to the resistance of the field winding of the loudspeaker, and provides artificial loading when a magnetic or a self excited dynamic speaker is connected to the loudspeaker jacks on the chassis.

The "Moving Coil" loudspeaker used with the Radiola 45E must have a field coil resistance of 7,500 ohms. The A.W.A. M.C. loudspeaker supplied with Radiola 34E is not suitable for use with the Radiola 45E.

The power unit section of the Radiola 45E occupies the rear half of the chassis.

One container houses the power transformer rated at approximately 80 watts and carries three separate secondary windings. The first two windings supply the plates and filament of the UX280 rectifying valve and the third lights the filaments of the remaining valves.

When the "Moving Coil" loudspeaker (7,500 ohms) is being excited from the power unit it is connected directly across the rectifier.



The smoothing unit is located in the second container.

The plate supply for the UX245 power valve is smoothed by a suitable choke and associated condensers. The plate supply for the radio and detector valves is further smoothed with another choke and set of condensers.

Also the radio and detector plate supplies are decoupled with carborundum resistors and bypass condensers. From the +B of the Radio frequency valves is connected another resistor in series with the volume control which connects to the cathode of the R.F. valves.

The grid bias for the power valve is arranged by connecting a resistor between the centre of the filament mid tapped resistor and the negative of the B supply or chassis frame. The voltage drop in this resistor gives the requisite grid bias.

The Radio frequency valves and the detector valve are similarly biased.

The circuit diagram of the Radiola 45E is given in Fig. 5.

## FAULT LOCATION.

1. **EQUIPMENT TESTS.** Carry out equipment tests on all valves. See Equipment Tests in General Information Section.
2. **VOLTAGE TEST.** After removing the chassis from the cabinet, make the following voltage tests across the valve sockets with all the valves in position and with the loudspeaker connected and the chassis turned upside down. Fig. 6 shows the relative position of the valve contacts, the valves being shown in their correct sequence looking down on the upturned chassis from the back of the Radiola.

No reading or a greatly varying reading points to a fault in the Radiola.

Valve	Measure across	Volume control on maximum Approximate voltage
No. 1 Rectifier	F1 & F2	4.9V A.C.
	P1 & P2	700V A.C.
Nos. 2 and 3 R.F. Amplifiers	F1 & F2	2.30V A.C.
	P & C	165V D.C.
	SG & C	75V D.C.
	Chassis & C	1.5V D.C.
	F1 & F2	2.30V A.C.
No. 4 Detector	P & C	220V D.C.
	SG & C	70V D.C.
	Chassis & C	7V D.C.
	F1 & F2	2.3V A.C.
No. 5 Audio	P & F	235V D.C.
	Chassis & C	50V D.C.
	F1 & F2	2.3V A.C.

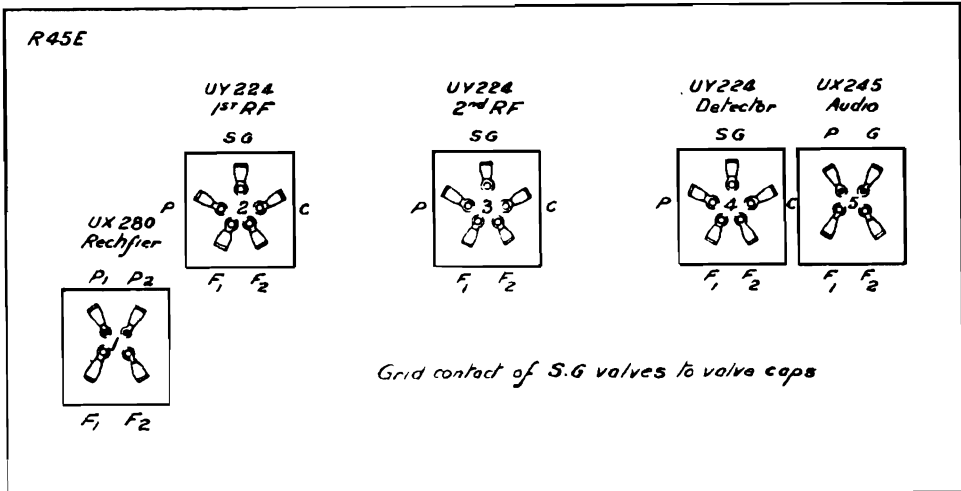


Fig. 6. Valve Sequence and Position of Valve Contacts, Radiola 45E.

## CONTINUITY TESTS.

If necessary, make the following continuity tests with some form of reliable continuity tester. Tests made across the points shown in Column 1 should give the effect shown in Column 2. If this effect is not obtained, Column 3 gives the probable cause of the fault.

Test between	Correct effect.	Incorrect effect caused by
Aerial terminal and chassis frame .. L-D Switch Local .. . . . .	Open Circuit.	Short circuit in wiring or defective switch.
L-D Switch Distance .. . . . .	Closed Circuit.	Broken connection or open circuit aerial coil.
Fixed plates of condensers and chassis frame (R-P switch on R) .. . .	Closed Circuit.	Broken connection or open circuit secondary of R.F. transformer.
Filament contact of rectifier valve and plate of R.F. valves .. . . . .	Closed Circuit.	Broken connection or open circuit in smoothing chokes, carborundum resistor or primary of R.F. transformer.
Filament contact of rectifier valve and plate of detector valve .. . . . .	Closed Circuit. (high resistance).	Broken connection, open circuit in smoothing chokes, carborundum resistor, audio choke or R.F. choke coil.
Filament contact of rectifier valve and plate of audio valve .. . . . .	Closed Circuit.	Broken connection, open circuit in smoothing choke or primary of output transformer.
Cathode of R.F. valve and frame ..	Closed Circuit.	Broken connection or open circuit bias resistor.
Filament of audio valve and frame	Closed Circuit.	Broken connection or open circuit bias resistor.
Plate of rectifier valve and frame ..	Closed Circuit.	Broken connection, open circuit in transformer secondary or loudspeaker compensating resistor.
Plate of detector valve and grid of audio valve .. . . . .	Open Circuit.	Broken down coupling condenser.
Power lead contacts (with voltage regulator switch on a contact) ..	Closed Circuit.	Broken connection or open circuit power transformer primary.
Power lead or 200-220-240-260 contacts and chassis frame .. . . . .	Open Circuit.	Breakdown of primary or connections to frame.
Screened grid contacts to cathode contacts of R.F. valves .. . . . .	Closed Circuit.	Broken connection or open circuit volume control.