Benjamin SHORTPATH Valve

Type SP. 18/G. (Green Spot)

INSTRUCTIONS.

IMPORTANT.—Read this before using the Valve.

(1) Use 2 volt accumulator only (filament rating is 1.6 to 1.8 volts).

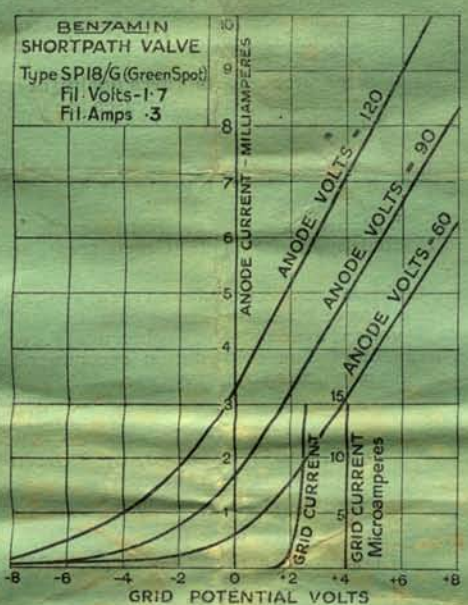
(2) A filament rheostat or regulator should always be used.

(3) Operate valve at lowest temperature that will give a good volume of sound by turning the rheostat or regulator down as low as possible. Increase of temperature of filament beyond this point tends to shorten the life of the valve without improving its efficiency.

If the above main points are carefully observed, the valve will have an exceptionally long life.

The filament operates at a very dull red heat, hardly visible in daylight.

If the valve fails to function properly, it may be due to bad contact between the valve pins and the sockets of the valve holder. This may be the case, even though the filament lights up. Try opening out the split pins with a penknife.



Characteristic Curves of Benjamin SHORTPATH Valve.

Type SP.18/G. (GREEN SPOT).

Filament voltage	1.6—1.8 volts
Filament current	0.3 amp
Anode voltage—for detector ...	20—80 volts
,, ,, for amplifier ...	up to 120 volts
Anode impedance, approx.	17,000 ohms
Voltage amplification factor ...	15.0
Mutual Conductance (slope of characteristic), approx.—	0.85 mA per volt

In case of any complaint concerning this valve it should be returned to the dealer from whom it was purchased.

BENJAMIN ELECTRIC LTD., LONDON.

Type SP. 18/G (Green Spot) Valve is suitable for:—

H.F. Amplifier.	All circuits, especially transformer (tight coupling) and tuned anode.
Detector.	All circuits.
L.F. Amplifier.	All circuits.

In the last stage, type SP. 18/R (Red Spot) should be used to operate a loud speaker at considerable volume.

NOTE.—See table below for types of SP. 18 Valves recommended to give the best results in any of the above stages.

H.T. Voltage.

H.F. Amplifier.	30-80 volts.
Detector.	30-80 volts.
L.F. Amplifier.	Up to 120 volts.

Grid Bias.

Detector. Grid leak should be connected preferably to positive terminal of accumulator, otherwise to positive end of filament. A grid leak of **2 to 5 megohms is suitable.**

H.F. Amplifier, L.F. Amplifier, Last stage — Grid return lead should be connected to negative end of L.T. through grid bias battery of voltage value shown below.

GRID BIAS TABLE FOR SP. 18/G (GREEN SPOT) VALVE.

Anode Voltage ...	45	60	90	120
Grid Bias, Volts ...	—	—	1½	3

Resistance Capacity Coupling Anode resistance of at least 100,000 ohms. should be used. Coupling condensers of 0.01 mfd. and grid leaks of 2 megohms are suitable.

The use of a grid battery not only improves quality of reproduction, but reduces H.T. current and greatly increases the life of the H.T. battery and the life of the valves.

BENJAMIN SHORTPATH VALVES.

The Benjamin Shortpath Valve, Type SP. 18 is made in three varieties, SP. 18/R (Red Spot), SP. 18/G (Green spot), and SP. 18/B (Blue Spot).

The following table shows which of these types is suitable for use in the different positions or stages in various circuits. (1) When a HT. voltage up to 80 volts is available. (2) When a HT. voltage up to 120 volts is available. The combination recommended for best results in each case is indicated by heavy type.

		Recommended Valves in SP. 18 Range 20—80v.	80—120v.
H.F. Amplifier	Tuned Anode (stabilised, by neutrodyne or otherwise)	Green	**BLUE**
	Tuned Anode (non-stabilised)	Green	—
	Transformer, loose Coupling	**RED**	—
	Transformer, tight Coupling	**GREEN**	—
	Resistance Coupling (for long waves above 2,000 metres)	Green	**BLUE**
Dual or Reflex Stage	L.F. Transformer or Choke	Red	**RED**
	Resistance Coupling	—	Red
Detector (Grid Leak)	Resistance Coupling	—	**BLUE**
	L.F. Transformer or Choke	Green	**BLUE**
Detector (Anode Bend)	Resistance, L.F. Transformer or Choke Coupling	—	**BLUE**
L.F. Stages	Resistance	Green	**BLUE**
	Transformer or Choke	Green	**GREEN**
Last Stage Loud Speaker	All Couplings	Red	**RED**

Quality of Reproduction.

For best quality of reproduction, resistance-capacity coupling is recommended. With Blue Spot Valves, the H.T. current and filament current are very considerably reduced. Resistance coupling is therefore preferable to L.F. transformer coupling from the points of view of both quality of reproduction and economy. If L.F. transformers are used, the best reproduction is obtained by the use of Red Spot Valves rather than Green Spot Valves in the intermediate stages.

NOTE: A 2,000 ohm Loud Speaker is recommended.