DYNATRON
"NOMAD"
MODEL TP 10

Issued by—Service Department,
Dynatron Radio Limited,
Maidenhead, Berks.

Dynatron "Nomad All Transistor Portable Radio

Model T.P. 10

The Dynatron "Nomad" is more than just a portable radio since it is designed to be used as a receiver for use in the home as well as outdoors. Its relatively light weight makes it immediately available wherever it is wanted, but no attempt has been made to achieve minimum size; instead, a large powerful speaker has been built into a wooden case, a combination capable of providing a performance far above average, and comparable with most table models rather than with portables.

ADVANTAGES OF THE ALL TRANSISTOR DYNATRON "NOMAD" PORTABLE RADIO

This Dynatron transistor receiver has the advantages of greater reliability, longer battery life and savings in weight and space, compared with a conventional valve receiver. The space saved by using transistors in the Dynatron "Nomad" has been used to enable a large loudspeaker, high quality transformers, two 6 volt batteries and dual ferrite rod aerials to be incorporated, thus ensuring quality sound reproduction, increased reliability, long battery life and higher sensitivity.

TYPE OF BATTERIES REQUIRED

Two six volt Ever-Ready PP1 batteries should be used, these have been specially manufactured for use with transistor portables, and are of sealed construction. The batteries should be placed in the metal container at the bottom of the receiver. It is important to remove batteries when they need replacement. Exhausted batteries should not be allowed to remain in the battery compartment, as this may lead eventually to corrosion of the battery container.

To place the batteries in position remove the metal plate at the base of the portable by means of the two captive, mushroom headed screws. The screw heads are located in small recesses at each end of the plate and should be turned in an anti-clockwise direction.

CONTROLS AND TUNING PROCEDURE

The Dynatron "Nomad" has three controls. (left to right) Volume On/Off, tuning and wave-changer. The functions of these controls are self explanatory.

Volume Control

This control incorporates an On/Off switch, it is important to turn the receiver off after use, otherwise the battery life will be reduced. The receiver is turned off when the volume control has turned in a fully anti-clockwise direction and the click of the On/Off switch is heard.

Wave Change

This switch is situated slightly below the centre of the scale and is actuated by a butterfly control. When this control is pressed down towards the left, the receiver is operating on medium waves; when pressed towards the right, the receiver is operating on long waves.

Tuning Control

This control is placed to the right of the scale. It enables stations to be selected, as indicated by the vertical pointer moving along the scale.

FOR THE BEST RECEPTION

The receiver incorporates a built in Ferrite Rod Aerial, and it will be found that the signal strength and noise vary as the receiver is rotated. When the receiver is tuned to a station and rotated, a point will be found where the signal is least and the noise is greatest. To obtain the best reception, the receiver should be turned at right angles to this null point, i.e. the best reception will be obtained when the receiver is pointed towards the broadcasting station. This effect will be most marked when receiving a weak signal.

An external aerial and earth may be connected to the receiver by means of sockets incorporated in the handle fixing screws. The aerial should be connected, by means of the plug provided, to the socket at the same end of the receiver as the tuning control. The use of an external aerial and earth is only recommended when the receiver is used in very poor reception areas, such as motor cars, caravans, metal framed buildings, or in valleys in hilly country, etc.

It is sometimes possible, when suffering from interference to minimise the effect by rotating the receiver for optimum results. This optimum position does not necessarily coincide with the position for maximum signal pick-up.

It will be found that the close proximity of metal structures, such as cars and iron girders, bridges, etc., will impair the sensitivity and the directional effect of the aerial. The receiver should therefore be operated as far as possible from the metal objects.

Transistors are sensitive to heat, and damage may be caused if the receiver is placed too near a fire or operated in a room temperature above about 110°F.

When receiving a strong local station some distortion may be noticed at full volume, this will disappear if the volume level is reduced slightly.

THE DYNATRON GUARANTEE

Dynatron portable transistor radios are guaranteed for twelve calendar months from the date of delivery to the original user, subject to the conditions set out on the Guarantee Card sent with the receiver. It is essential for you to read, complete and return the card within seven days to enable us to register your guarantee.

GENERAL

It should be realised that every effort has been made to produce a portable receiver of above average performance, and in order to achieve this, no attempt has been made at excessive miniaturisation.

Dimensions. Height=8" (including feet). Width=11¾". Depth (max.)=4⅝".

Weight. 6¾ lbs. (including batteries).

CASE

The case is of wood construction, bowed to produce added strength. This, when finished with a fabric cover, results in a case of unusual and pleasing appearance. The case is available in alternative colour schemes.

CONSTRUCTION

The components are assembled on a vertically mounted paxolin board, which is provided with bayonet type tags, giving a printed circuit type of construction with added flexibility for ease of servicing.

Scale. This is of transparent perspex, 4¼" x 1⅝", calibrated in metres, and with station names added.

Controls. (1) Tuning Control. (2) ON/OFF and Volume Control.

COVERAGE (Approx.)

Medium Wave=195 metres—535 metres.
Long Wave=1,100 metres—1,800 metres.

TECHNICAL FEATURES

Aerial. Large, high permeability ferrite rod, for medium waveband. Separate ferrite rod for long waves.

Audio. Two transformers are used, together with a matched pair of OC72 transistors, mounted on a substantial heat sink and employing a 12 volt supply. This system gives the best results in terms of power output and low distortion, obtainable from a transistor output stage.

Speaker. A high sensitivity elliptical speaker is mounted on a wooden baffle, and ventilation is provided at the back of the case to prevent undue air loading at the back of the speaker. The size of the speaker is 9¾" x 4¼" and the magnet is 11,000 G.

Batteries. Two 6v. Ever-Ready PP1 are connected in series. These batteries are specially designed for transistor application, and are completely sealed. This safeguards the portable from damage due to corrosion. The special type of battery construction used ensures long shelf life. Batteries of this type should be readily available at all radio dealers.

Special Feature. Provision is made for individual balancing of transistor characteristics to provide optimum performance.

TECHNICAL DATA

Aerial. Two ferrite rods.

Oscillator. Self oscillating mixer, employing OC44 transistor.

I.F. Three single tuned IF transformers, IF Frequency=470 Kc/s, using OC45 transistors.

Detector. Germanium Point Contact Diode OA70.

Volume Control. There is no D.C. path through the Volume Control.

1st A.F. Stage. An OC71 transistor is used as a driver stage.

Output. Two OC72 transistors are used, operating in Class "B" push-pull.

Audio Frequency Response. 100 c/s—10 Kcs.

Power Delivered to Speech Coil. Approximately 300 mW.

Speaker. Dimensions=9¾" x 4¼". Flux Density=11,000 gauss. Cone Resonance=100 c/s. Speech Coil Impedance=3 ohms.

Audio Circuitry. Two transformers are used in conjunction with a matched pair of OC72 transistors, mounted on a heat sink. A substantial output transformer is used, and wound for use with a low impedance speaker. Negative feedback is applied between the secondary of the output transformer and the emitter of the driver transistor.

Driver Transformer. The secondaries are bi-filiar wound, so as to reduce cross-over distortion.

Batteries. Two 6v. Ever-Ready PP1 are connected in series.

TEST SPECIFICATION FOR "NOMAD" TRANSISTOR PORTABLE

Test Gear Required:

RF Signal Generator 165 Kc/s—1.5 Mc/s.
D.C. Valve Voltmeter.
Shielded Radiating Coil.
Audio signal generator.
Output power meter.
Avo Model 8. Oscilloscope.
12 Volt Battery to operate receiver (not fully changed lead acid type).
Static D.C. Voltages. (All D.C. Voltages are negative with respect to chassis).

	Emitter	Base	Collector
TV1.	1.0 (across C3).	0.9 (across C2).	6.4 (across C28)
TV2.	0.58	0.68	6.3
TV.3	0.77	0.9	7.1
TV4.	1.26	1.35	11.4
TV5.	0.08	0.25	12.0
TV6.	0.08	0.25	12.0

I.F. Alignment.

1. Set up receiver and shielded coil with the axis of the Ferrite aerial rods parallel to the axis of the shielded coil, with a separation of 24" between centres.
   This arrangement is to be maintained for all RF tests.
2. Connect D.C. Valve voltmeter across diode load R15, (use tags for screened lead on audio section of receiver).

3. Switch receiver to M.W. and tune to 550 metres.
4. Switch on receiver, adjust zero of V.V. to back off standing bias from receiver.
5. Inject signal of 0.5 Volts (Measured across co-ax. cable) at 470 Kc/s into shielded coil.
6. Adjust cores of L4, L5, L6 for maximum reading on V.V.

I.F. Sensitivity.

With the above input signal valve voltmeter should read approximately 0.6 Volts.

Alternative IF Sensitivity Check.

Connect signal generator (70 ohms), between TV1 Base and junction of C2 and R3. Input required to give 0.6 Volts on valve voltmeter should be approximately 70 uV.

Oscillator Alignment M.W.

Use shielded coil for signal source.

1. Tune receiver to 500 metres, set signal generator to 600 Kc/s adjust core of L3 for max. output.
2. Tune receiver to 200 metres, set signal generator to 1500 Kc/s adjust CP5 (on gang condenser) for max. output.
3. Repeat 1 and 2 until no improvement in calibration can be made.
4. Check calibration at 330 metres (Home service). Error should not exceed the width of the "pointer".

Oscillator alignment L.W.

1. Switch set to L.W., tune to 1500 metres.
2. Adjust CP4 for max. signal from long wave "Light programme".

Aerial coil alignment M.W.

1. Set signal generator to 600 K/cs.
2. Tune receiver for max. output.
3. Slide M.W. aerial coil on rod for max. output.
4. Set signal generator to 1500 Kc/s.
5. Tune receiver for max. output.
6. Adjust CP1 (on gang condenser) for max. output.
7. Repeat 1—6 until no improvement can be made.
8. Fix coil to Ferrite Rod with adhesive tape.

Aerial Coil Alignment L.W.

1. Set signal generator to 165 Kc/s.
2. Tune receiver for max. output.
3. Slide L.W. aerial coil on rod for max. output.
4. Set signal generator to 250 Kc/s.
5. Tune receiver for max. output.
6. Adjust CP4 for max. output.
7. Repeat 1—6 until no improvement can be made.
8. Fix coil in place on Ferrite rod with adhesive tape.

Sensitivity Check.

Inputs to shielded coil to give 0.5V D.C. output.

MW.		LW.	
1,500 Kc/s	15 MV	250 Kc/s	30 MV.
1,000 Kc/s	15 MV		
600 Kc/s	15 MV	165 Kc/s	78 MV.

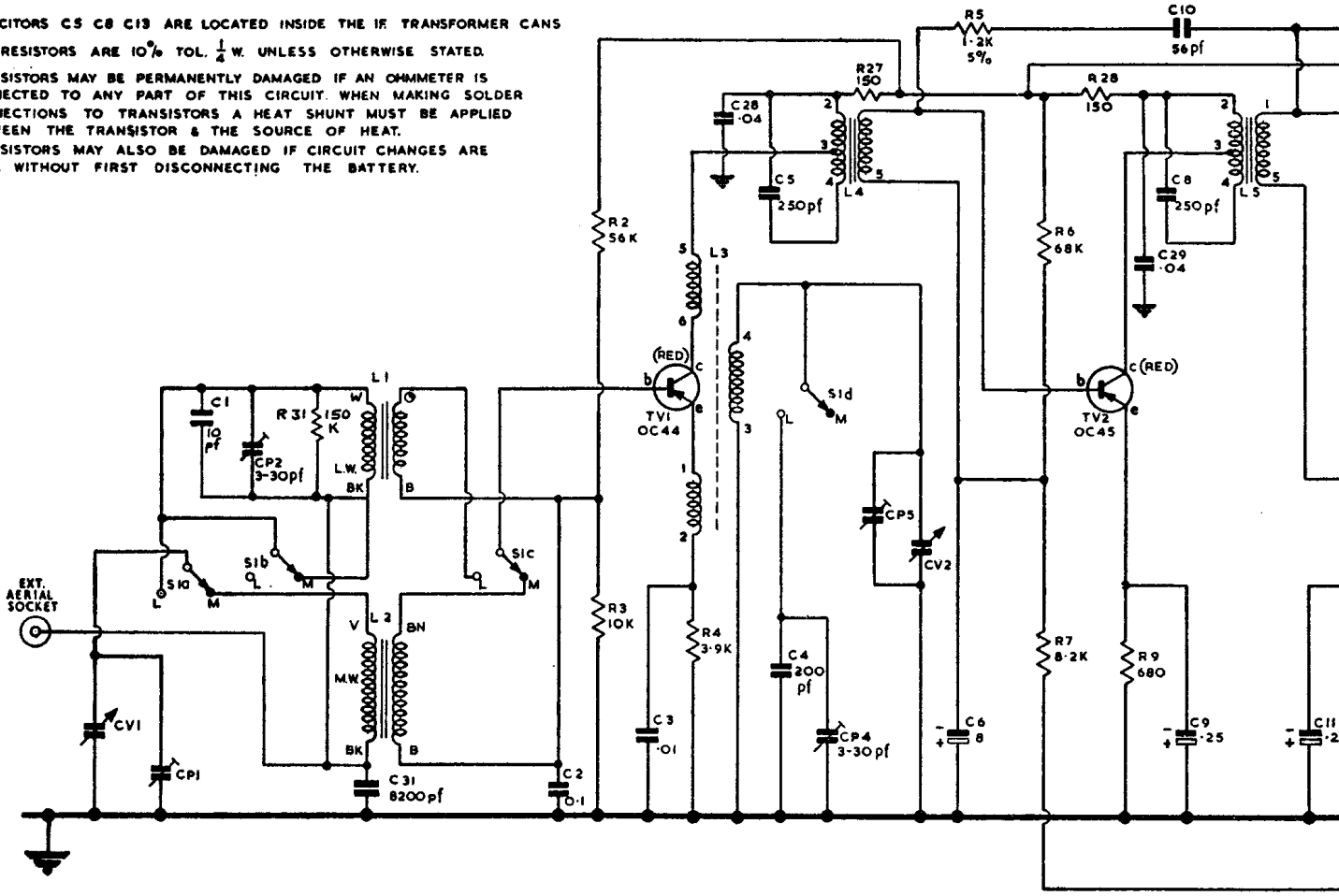
Audio Tests.

1. Disconnect inner of screened lead from RF. board at tag on audio section. Connect audio generator to tags now free.
2. Disconnect loud speaker, connect power meter in place of speaker. Set power meter to 6 ohms impedance, and to 1 watt range. Connect oscilloscope across power meter.
3. Set volume control to maximum.
4. Inject 1000 cps. signal from signal generator and adjust input to give maximum undistorted output.
   Output power to be 200—300 MW.
   Input not greater than 190 M.V.
5. Maintain input level constant and feed in 200 cps. signal.
   Output to fall by not more than 2Db.
6. Feed in 5 Kc/s signal.
   Output to fall by not more than 3 Db.

Adjustment of balance control.

Re-connect loud speaker, feed in 400 cps. signal, set volume control to give a low output, adjust slider of R.V.2. for minimum high pitched "buzz" in output.

NOTE:
1. CAPACITORS C5 C8 C13 ARE LOCATED INSIDE THE IF. TRANSFORMER CANS
2. ALL RESISTORS ARE 10% TOL. $\frac{1}{4}$ W. UNLESS OTHERWISE STATED.
3. TRANSISTORS MAY BE PERMANENTLY DAMAGED IF AN OHMMETER IS CONNECTED TO ANY PART OF THIS CIRCUIT. WHEN MAKING SOLDER CONNECTIONS TO TRANSISTORS A HEAT SHUNT MUST BE APPLIED BETWEEN THE TRANSISTOR & THE SOURCE OF HEAT. TRANSISTORS MAY ALSO BE DAMAGED IF CIRCUIT CHANGES ARE MADE WITHOUT FIRST DISCONNECTING THE BATTERY.



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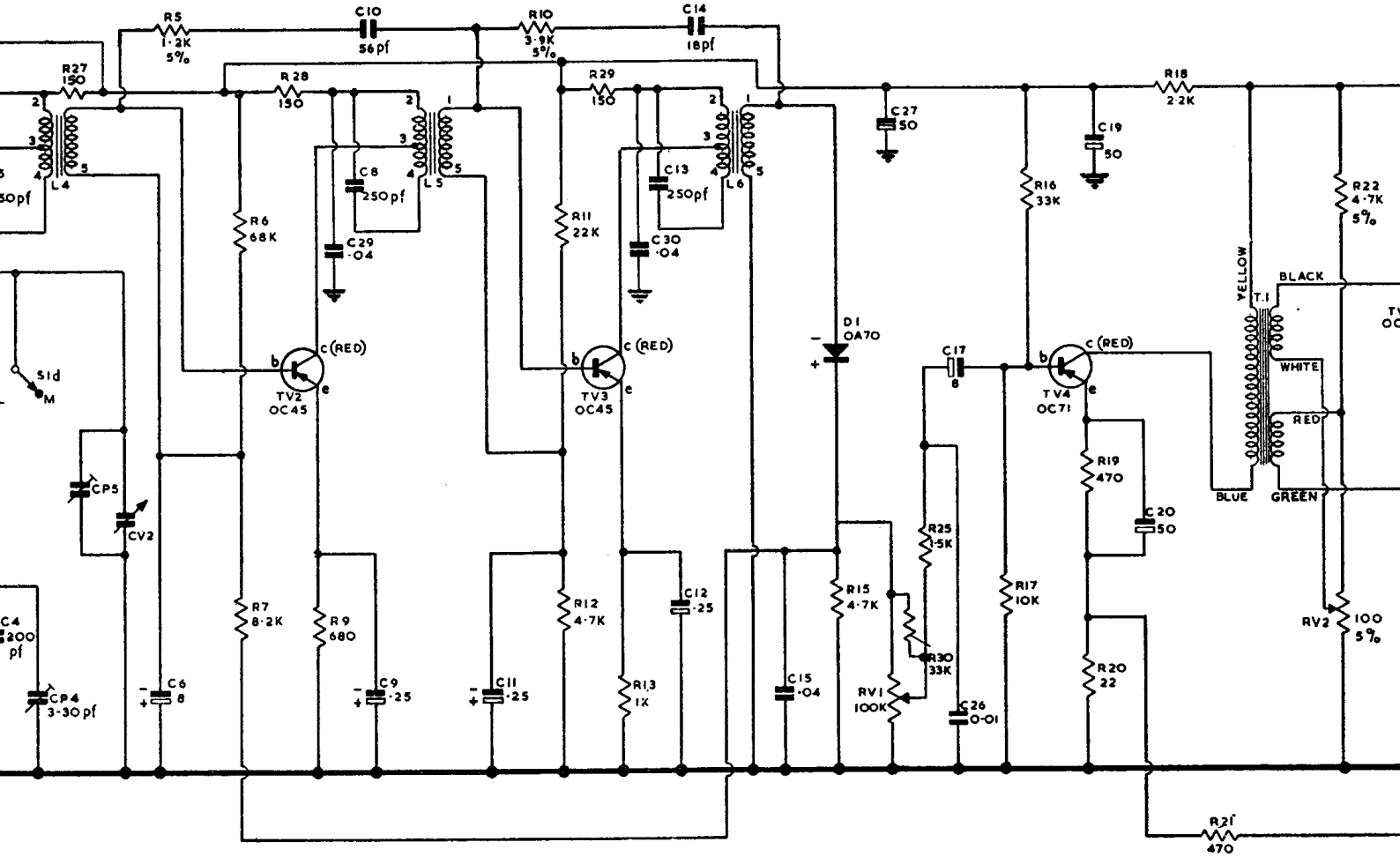

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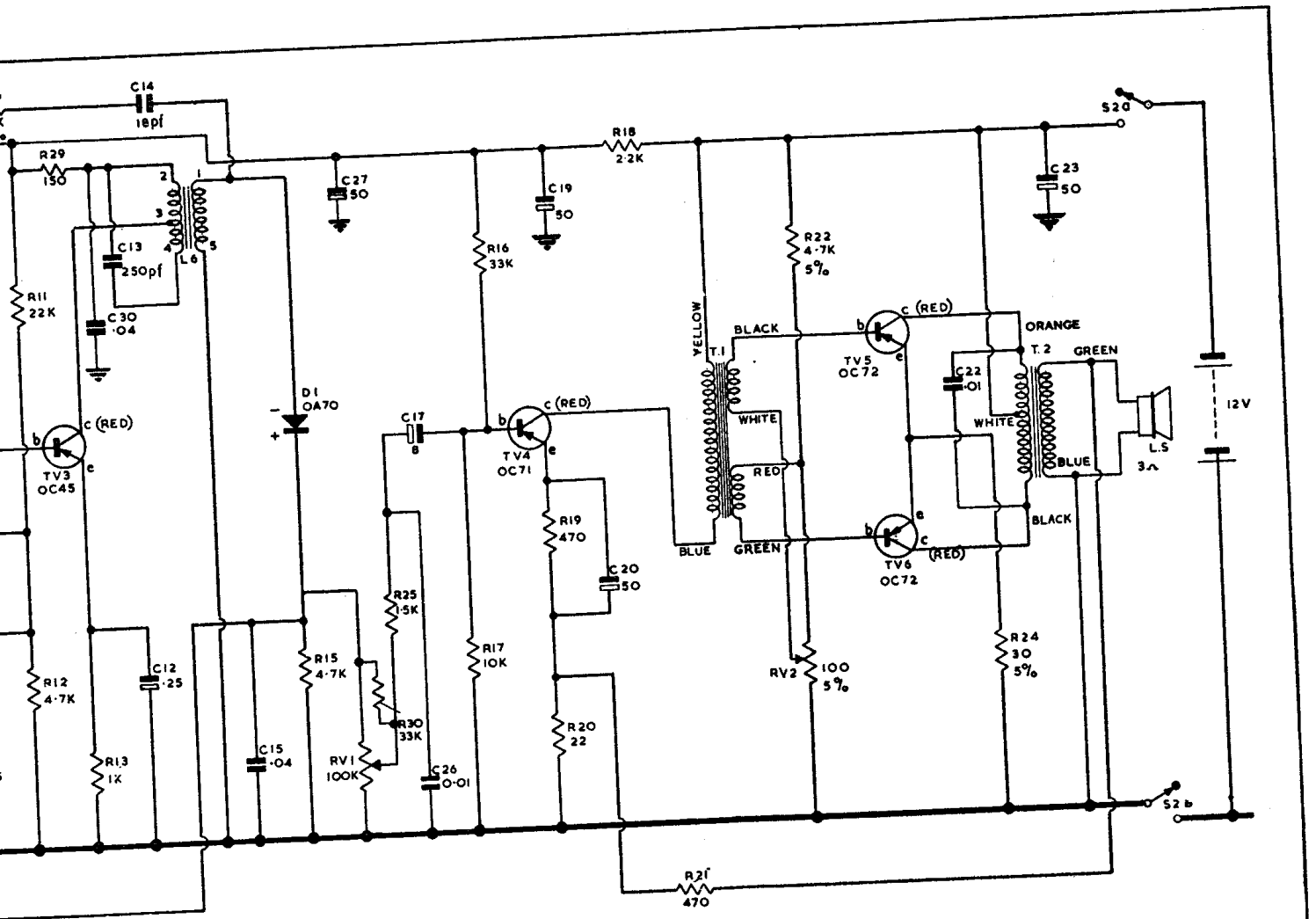

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