SERVICE DATA

ISSUE 1

TS2 STEREOGRAM &

601S COMBINATION T.V. & STEREOGRAM

CHASSIS MODEL NºR26–1A'2A

STEREOGRAM SPECIFICATIONS

1. Radio Tuner

Tuning Range	525–1640 Kc/s
Intermediate Frequency	455 Kc/s
Input Signal Range	10 uV/M to 1 volt/metre

2. Audio

Audio Sensitivity	150mV for full output
Maximum audio output	3 watts
Frequency Range	30 c/s to 20,000 c/s
Treble Control Range	± 10 dB at 10,000 c/s
Bass Control Range	± 10 dB at 100 c/s
Transient Response	10% maximum overshoot

3. General

Power supply	230, 240 or 254V 50 cps A.C.
Power Consumption	70 watts
Valve Complement	(1) 6CA4
	(2) 6GW8
	(1) 12AU7-A
Transistor Complement	(2) 2N373 (Anodeon)
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Speakers	(2) 6P1 Magnavox 15Ω
	(2) 4TC Magnavox 7.5Ω
Record Changer	

RADIO TUNER

The radio tuner is on a separate printed circuit panel and has been transistorised, following the modern trend to transistors. Drift transistors are used through out and this gives more gain and a better AVC characteristic than the usual two valve radio tuner, while at the same time comparing favourably economically.

NOTE: Since there is a positive voltage available from the power supply, the radio tuner is run from a positive nine volt rail. This is the opposite of some small transistor radios which operated from a negative supply, and results in the collectors rather than the emitters being returned to chassis. When voltage measurements are made on the radio tuner the voltages measured will be positive with respect to chassis, and to find the actual transistor voltagess these must be subtracted from the supply voltage. For instance: if the collector of TR2 measures +5V and the supply voltage is +9V, then the actual collector voltage is -4V.

To eliminate these calculations the positive lead of the meter may be connected to the radio +9V rail and all voltage measurements made with respect to this point. This method will give the usual negative voltages directly, but cannot be used with a V.T.V.M. since the positive lead may be grounded, and the H.T. will be shorted.

A large diameter loopstick has been used for increased signal pickup and is matched to the base of the self oscillating mixer for optimum signal to noise ratio. The mixer is coupled to a two stage I.F. amplifier by the bandpass coupling coil L3, and the base circuit of both I.F.'s are matched by means of a capacitive tap to ensure high transfer efficiency.

A.V.C. is applied to both IF amplifiers and also to the convertor by means of the damping diode D1. The first IF Amplifier acts as a DC amplifier for the damping diode and enables the audio output to be held constant over widely varying input signals. The detector diode D2 is driven by the matching transformer L5, the demodulated output being developed across the diode load R14. So that the A.V.C. control voltage can be applied between the base and emitter of the controlled stages, the detector circuit is returned to the positive supply voltage. R15 and C17 provide the AVC time constant, and R17 gives forward bias for the IF amplifiers. The audio is returned to chassis by C18, and the audio output is connected to the selector switch by the bass correction capacitor C16.

AUDIO AMPLIFIER

Both audio channels are identical and consist of a two stage voltage amplifier followed by a Class A output stage which delivers three watts to two matched speaker systems. Feedback is applied independantly to the output stage by returning its unbypassed cathode resistor through the output transformer secondary. This linearises the transfer characteristic of the output stage and reduces the distortion as well as providing a low output resistance from the amplifier.

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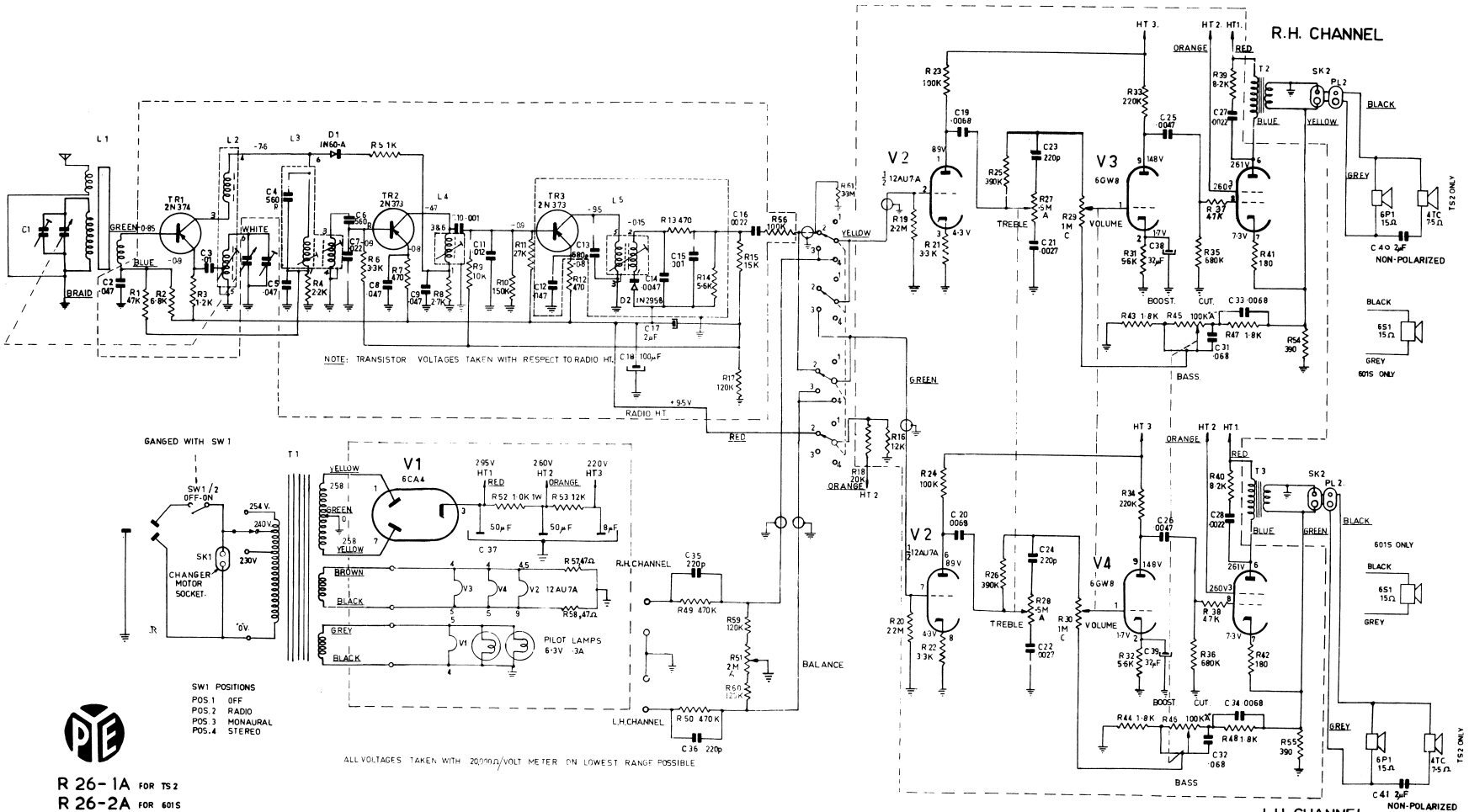
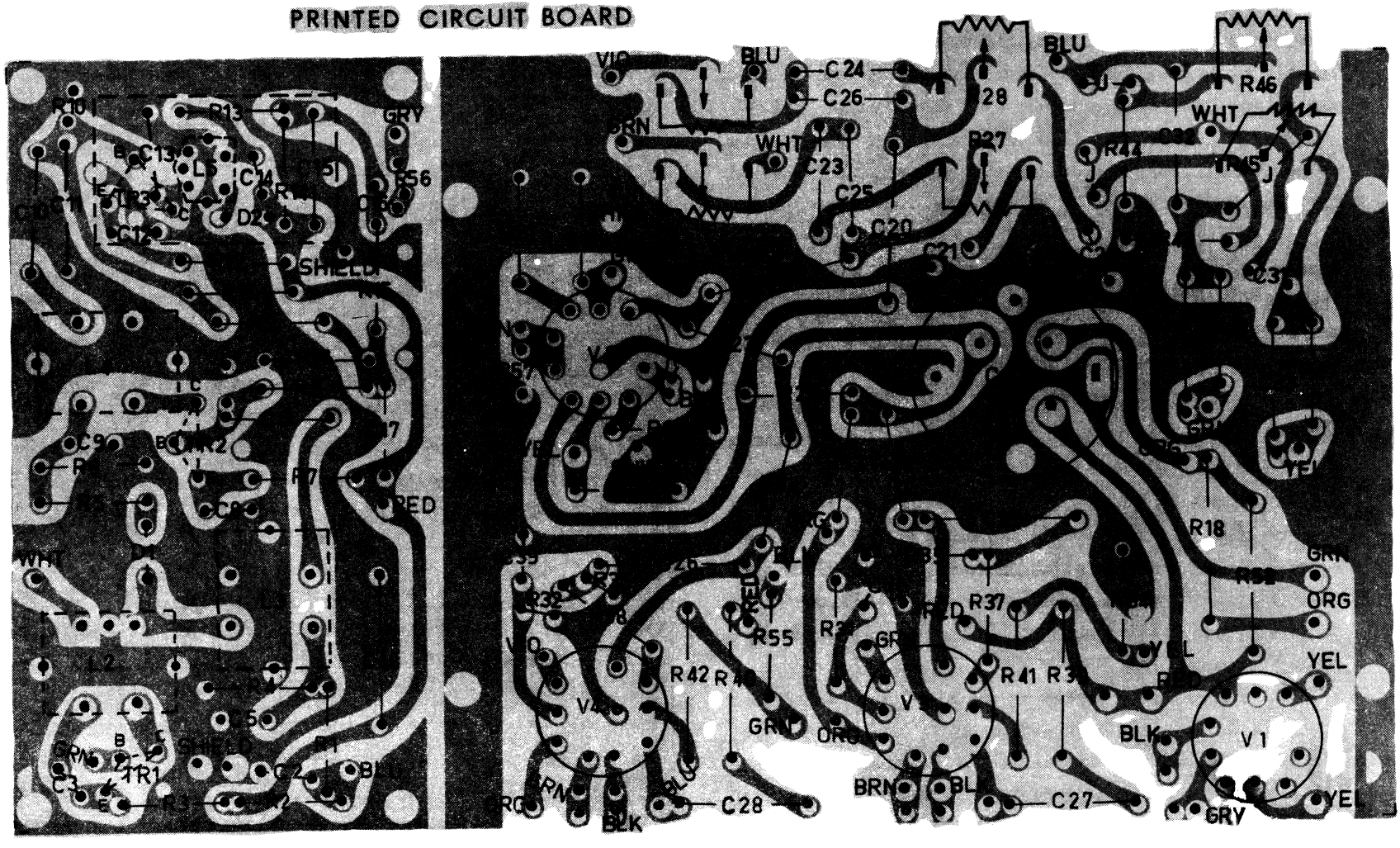


R 26-1A FOR TS2
R 26-2A FOR 601S

PRINTED CIRCUIT BOARD



Overall feedback is applied to the bottom of the volume control, and the bass control network is included in this circuit so that the bass response is increased as the volume level is decreased, giving loudness compensation. C33 is the phase correction capacitor for the output transformer and works in conjunction with R47 and the network R39, C27 to give good transient response for high frequency audio peaks. The treble control is placed between the voltage amplifier stages so as to be independant of the bass control. C19 and C25 have been selected so as to give a rapid roll off at frequencies below 30 c/s and hence minimise rumble.

Each amplifier feeds into a speaker system consisting of a high efficiency six inch bass speaker with a four inch tweeter connected across it by means of the crossover capacitor C40. This capacitor is a non-polarised electrolytic and acts in conjunction with the tweeter voice coil impedance to give crossover above 1200 c/s. The speakers have staggered voice coil impedances so as to give a constant impedance load and enhanced high frequency response.

Each speaker system is contained in a tuned bass reflex enclosure with a damped resonant back. This aids the bass speaker and increases the low frequency output while at the same time reducing the speaker distortion. All speakers are correctly phased and if replacement is necessary this must be carefully observed.

ALIGNMENT PROCEDURE

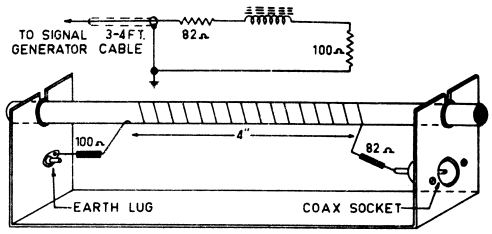
Alignment should not be necessary unless repairs have been made to a tuned circuit. When alignment is necessary the following procedure should be followed:

Set the switch to position one and turn the volume and tone controls to maximum. Connect a 15Ω output meter to one channel, and terminate the other channel either with its speakers or with a 15Ω 5W resistor. During the alignment the output should be kept below 100 mW to make sure the A.V.C. is inoperative.

To inject a signal into the loopstick, it is necessary to radiate a signal from the signal generator. When measurements are not necessary a 2 ft length of wire may be used, placed vertically and 2 ft from the receiver. If sensitivity measurements are to be taken the following radiator may be used with 1 dB accuracy throughout the band.

17 turns of 22 to 26 B & S wire are wound over an 8" x 3/8" dia loopstick spaced to cover 4" about the centre of the rod. The generator is fed to one end of the winding via 82Ω and the other end is returned to earth by 100Ω. Both resistors should be carbon types.

In use the radiating loop is placed parallel to the receiver loopstick and 24" from it, keeping the centres of both loops roughly in line. The equivalent field strength at the receiver is then found by dividing the generator reading by 20; i.e. 20 mV on the generator gives a field strength of 1 mV/metre at the receiver.



I.F. ALIGNMENT

Connect the signal generator to the base of the converter TR1 via an 0.047 uF capacitor and set its frequency to 455 Kc/s. Set the receiver dial to the extreme low frequency end and tune all I.F. coils for maximum output, keeping the output below 100mW by adjusting the generator.

R.F. ALIGNMENT AND SCALE CALIBRATION

If the gang is replaced it may be necessary to recalibrate the dial scale. To do this first fully mesh the gang and adjust the pointer so that is lies over the band limit mark on the scale. This mark and the calibration marks are along the bottom of the dial and cannot easily be seen when the chassis is on its front plate.

Connect the signal generator to the radiating loop and set the frequency to 640 Kc/s. Tune the receiver to the first calibration mark under 5CK and adjust the oscillator coil L2, and the loopstick tuning for maximum output.

Set the generator to 1470 Kc/s and tune the receiver to the third calibration mark under 3MA and adjust the oscillator and aerial trimmers for maximum output. Repeat these adjustments until no further improvement can be achieved.

Set the generator to 980 K/cs and tune the receiver to this signal. Check that the pointer is within 1/16" of the second calibration mark under 2KM.

PERFORMANCE FIGURES

These are taken at 980 Kc/s and with 30% modulation on the generator.

1. I.F. SENSITIVITY:
   For 100 MW output with the generator connected to the base of TR1 via an 0.047 uF capacitor 20uV ± 3dB.
2. SIGNAL TO NOISE RATIO:
   For 200 uV/metre input note the audio output and then remove the modulation. The audio output should fall at least 19 dB.
3. A.G.C. CHARACTERISTICS:

20 uV/metre	- 10dB max.
1 mV/metre	0dB
300 mV/metre	+ 10dB max.

NOTE: To achieve 300mV/metre the loop should be placed 10" from the receiver loopstick. The generator now reads field strength directly: i.e., 100 mV gives a field strength of 100 mV/metre.