

## U.H.F. OFF-AIR CUE RECEIVERS UNI/584 AND UNI/584A

### Introduction

The UNI/584 and the UNI/584A u.h.f. receiver units provide medium-grade standard-level video and sound signals for comparison purposes. The receivers are continuously tunable and incorporate an a.g.c. system operating from the tips of sync pulses and are suitable for negative modulated signals only. The sound channels employ inter-carrier detection and ratio discriminators. The two receivers are identical except that the UNI/584A uses npn transistors in the u.h.f. front end.

The receivers are mounted on CH1/12A chassis and are intended for use with the PS1/15 Loud-speaker and Power Supply Unit in the RC1L/501 receiver.

### General Specification

<i>Aerial Input Level</i>	100 $\mu$ V to 25 mV
<i>Frequency Coverage (Band IV and V)</i>	467 MHz to 860 MHz
<i>Noise Figure</i>	
470 MHz	10 dB max.
800 MHz	11.5 dB max.
<i>V.S.W.R.</i>	1:3
<i>Aerial Input Impedance</i>	75 ohms nominal
<i>Video Output Level (terminated)</i>	1 V p-p
<i>Video Output Impedance</i>	75 ohms
<i>D.C. Level at Video Output (no input)</i>	
With respect to negative supply line	+4 V
With respect to positive supply line	-7 V
<i>Sound Output Level</i>	1 V p-p
<i>Local Oscillator Frequency</i>	Signal frequency +i.f.
<i>Image Rejection</i>	53 dB min.

<i>Vision Carrier i.f.</i>	39.5 MHz
<i>Sound Carrier i.f.</i>	33.5 MHz
<i>Adjacent Sound Rejection</i>	46 dB min.
<i>Sound Rejection</i>	40 dB min.
<i>I.F. Rejection</i>	60 dB min.
<i>Chrominance to Luminance Ratio</i>	unity $\pm$ 2 dB
<i>Sound i.f.</i>	6 MHz
<i>Sound De-emphasis</i>	50 $\mu$ s
<i>Automatic Gain Control</i>	$\pm$ 2 dB change of output for 60 dB change of input
<i>Chrominance/luminance Timing</i>	$\pm$ 50 ns
<i>Operating Temperature Range</i>	0° C - 50° C
<i>Power Requirements</i>	11 V, 130 mA
<i>Weight</i>	2 lb

### Circuit Description

The circuit diagram for the UNI/584 is given in Fig. 1 and for the UNI/584A, in Fig. 2.

The U.H.F. tuner is made by A. B. Metal Products Ltd. and is contained in a fabricated metal box. This box should not be opened as the alignment and performance of the tuner may be impaired.

TR1 is a tuned input tuned output common base r.f. amplifier with a.g.c. applied to the base. The collector circuit has a bandpass characteristic with a bandwidth exceeding 6 MHz. TR2 operates as a self-oscillating mixer.

### I.F. Circuits

The i.f. signals developed at the collector of TR2 are coupled to the base of TR3 by the capacitance-coupled bandpass circuit L8, L11A, C25, C27 and C28. Inductors L11A and L11B also form a bifilar

T trap rejecting the adjacent signal and channel 1 signal on 41.5 MHz.

TR3, TR4 and TR5 are neutralised i.f. amplifiers with forward a.g.c. bias used on TR3. The coupling between TR3 and TR4 is series tuned because this minimises change of tuning with change of base current due to a.g.c. A reasonably flat response is presented to the base of TR4. The coupling in the collector circuit of TR4 is tuned on both primary and secondary and presents a flat response to the final i.f. amplifier TR5. TR5 feeds the sound detector diode D2 and the vision i.f. transformer L15. L15 is tuned to 38 MHz and feeds the vision detector D3. A tertiary winding, tuned by C44 and connected in antiphase to the secondary winding, rejects the sound i.f. carrier on 33.5 MHz. Balance between the 33.5 MHz signals in the two windings is obtained by adjustment of R21; L16 bypasses the video signals. The response of the tertiary winding above resonance lifts the response at 34 MHz and the overall response to the vision detector diode is rounded with the vision carrier at  $-6$  dB and the chrominance carrier at  $-5$  dB  $\pm 1$  dB.

#### Video Circuits

The vision detector is forward biased, the bias being set by R30. The bifilar T trap, L18/C46, is tuned to 6 MHz to reject the intercarrier signals and L19 attenuates the vision i.f. signals. TR6 and TR7 form a long-tailed pair, the video signal at the collector of TR7 passing to the output via the emitter follower TR8. L21 with C53 and C54 form a phase corrector network improving the video pulse response. The negative feedback from the emitter of TR8 to the base of TR7 is reduced over the chrominance spectrum to correct the overall luminance to chrominance ratio.

#### A.G.C.

TR11, which is d.c. fed from D3 via TR6, operates as a peak detector on the tips of the positive going sync pulses with a reference d.c. level obtained from the zener diode D4 and the potential divider R47, R49. The a.g.c. signal at the collector of TR11 is directly coupled to TR12 which, from its emitter, controls the forward bias of TR1 and TR3. D1 is biased to delay the a.g.c. feed to TR1 so that approximately 30 dB of i.f. attenuation occurs before the r.f. stage attenuates, thus maintaining a good signal-noise ratio up to high input levels. Integration of the a.g.c. signal is provided by the capacitors C74 and C75 and the maximum receiver sensitivity is set by resistors R48 and R50. The

peak-to-peak video output level is set by R49.

The UN1/584A uses npn transistors in the tuner and the polarity of the a.g.c. feed to TR1 must be reversed. It is taken from the junction of R12 and L12 (Fig. 2). The operation is otherwise the same.

#### Sound

The intercarrier sound detector diode D2 produces the full video signal with the 6 MHz sound signal across R33. The parallel-tuned circuit L22, C56 selects the sound signal and couples it to the first sound i.f. amplifier, TR9. TR9 operates as a neutralised common-emitter amplifier with the collector circuit tuned to 6 MHz and overcoupled to give a bandwidth of 250 kHz at  $-6$  dB. TR10 is a neutralised common-emitter amplifier/limiter feeding the discriminator transformer L24, tuned to 6 MHz on both primary and secondary. The diodes D5 and D6 operate as a ratio discriminator and adjustment of R44 allows maximum a.m. rejection to be obtained. The de-emphasised sound signal is obtained at the junction of R34 and C67.

#### Tuning

The receiver is tuned first for maximum undistorted sound and then for minimum sound patterning on the video signal commensurate with a good sound signal.

#### Maintenance

Routine maintenance is not required and the adjustments of the various preset controls should not be disturbed.

The standing d.c. potential at the video output when terminated with 75 ohms, should be approximately  $-7$  volts. This is adjusted by R30.

With an r.f. input of 3 mV  $\pm 6$  dB, fully modulated with a composite video signal, R49 is adjusted to give a video output of 1 V p-p.

Note that adjustment of R30 affects the setting of R49. R30 primarily sets the linearity on colour signals and it is preferable to make the final adjustment of R30 for minimum differential gain distortion, using a known r.f. signal, modulated with 100% colour bars. The setting of R49 should be checked at the same time.

A circuit diagram is displayed inside the base cover of the receiver.

#### References

1. Designs Department Specification 8.253(67)
2. Designs Department Technical Memorandum 8.236(67)

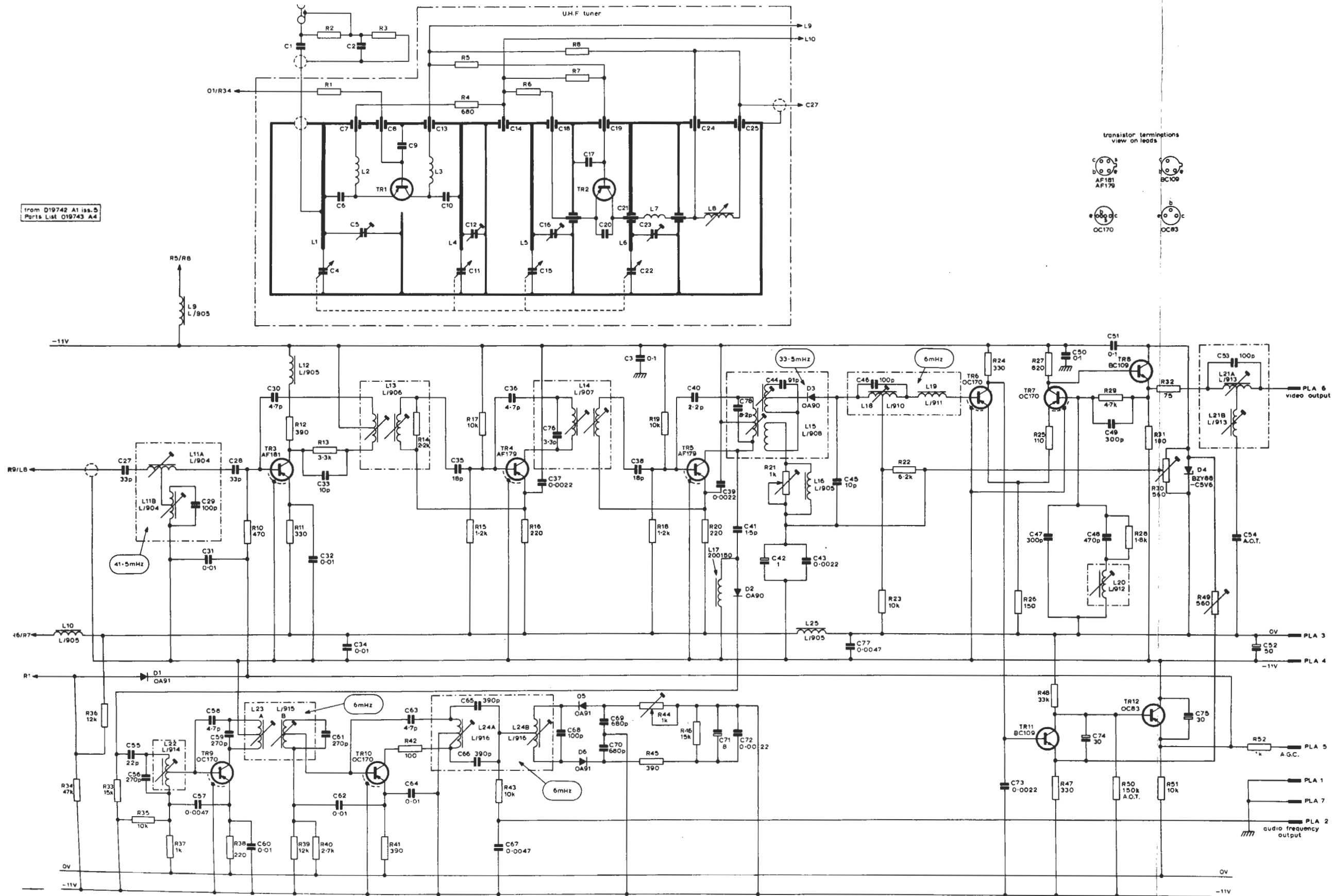
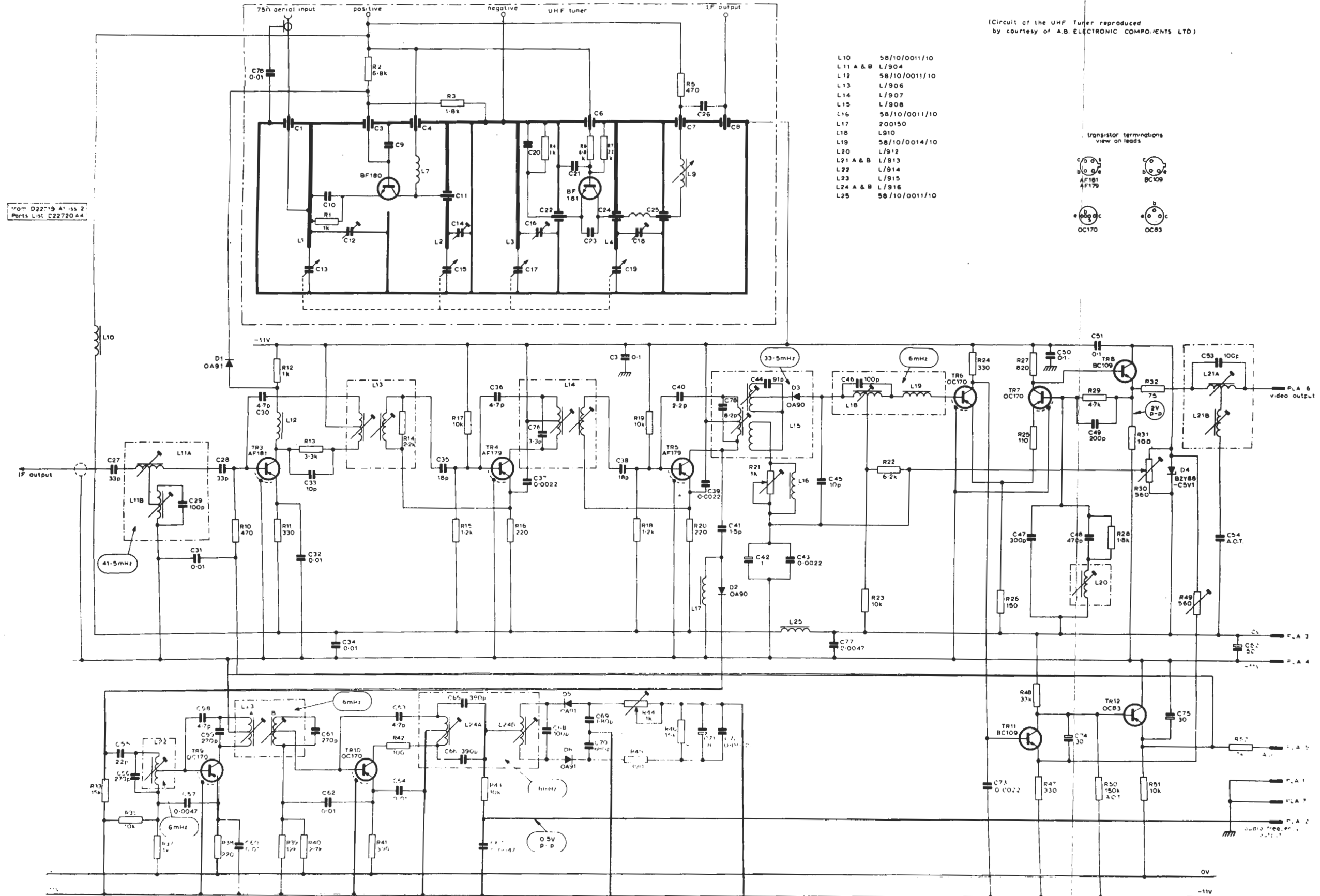


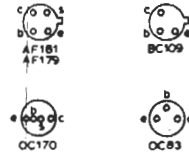
Fig. 1 Circuit of the UN1/584

(Circuit of the UHF Tuner reproduced by courtesy of A.B. ELECTRONIC COMPONENTS LTD)



- L10 58/10/0011/10
- L11 A & B L/904
- L12 58/10/0011/10
- L13 L/906
- L14 L/907
- L15 L/908
- L16 58/10/0011/10
- L17 200150
- L18 L910
- L19 58/10/0014/10
- L20 L/912
- L21 A & B L/913
- L22 L/914
- L23 L/915
- L24 A & B L/916
- L25 58/10/0011/10

transistor terminations view on leads



from D22719 A1 iss 2 Parts List C22720 a.d.