V.H.F. OFF AIR CUE RECEIVER UN1/585

The UN1/585 is a v.h.f. receiver providing medium grade standard-level video and sound signals for comparison purposes. It is pretuned to the 13 v.h.f. channels in Bands I and III and incorporates an a.g.c. system operating from blanking level. It is suitable for positive vision modulation only.

The receiver is mounted on a CH1/12B chassis and is intended for use with the PS1/15 Loudspeaker and Power Supply Unit in the RC1L/502 receiver.

General Specification

Aerial Input Level 50 μV to 50 mV r.m.s.

Frequencies (MHz)

Channel Numbers	*Sound*	*Vision*
1	41·5	45
2	48·25	51·75
3	53·25	56·75
4	58·25	61·75
5	63·25	66·75
6	176·25	179·75
7	181·25	184·75
8	186·25	189·75
9	191·25	194·75
10	196·25	199·75
11	201·25	204·75
12	206·25	209·75
13	211·25	214·75

Aerial Input Impedance	75 ohms nominal
Video Output Level (terminated)	1 V p-p ±1 dB
Video Output Impedance	75 ohms
D.C. Level at Video Output (no input)	
With respect to the negative supply line	+2 V
With respect to the positive supply line	−9 V
Sound Output Level 30% mod.	0·5 V p-p
Local Oscillator Frequency	Signal frequency + i.f.
Image Rejection	50 dB min.
Vision Carrier i.f.	34·65 MHz
Sound Carrier i.f.	38·15 MHz
Adjacent Channel Sound Rejection	35 dB min.
Sound Rejection	40 dB
Automatic Gain Control	±1 dB change of output for 40 dB change of input
Operating Temperature Range	0° C to 50° C
Power Requirements	120 mA at 11 V
Weight	2·5 lb

Circuit Description

The circuit diagram is given in Fig. 1. The v.h.f. input signal is converted to vision and sound i.f. in a 13-channel turret tuner. This uses 3 npn transistors as r.f. amplifier, mixer and local oscillator and is manufactured by A.B. Electronics Ltd.

Vision I.F. Circuits

The output from the mixer stage is coupled to the base of TR1 by a capacitance-coupled band-pass circuit consisting of L1A and C2 with the output circuit of the tuner. The series tuned circuit L1B, C4 rejects the adjacent sound channel on 33·15 MHz. Forward a.g.c. is applied to TR1 and the collector is tapped down L3 to minimise change of response with a.g.c. action.

TR2 is a normal common-emitter amplifier with a tuned collector circuit from which two outputs are

taken. One output feeds the main sound rejector L4B, C14, C15 in the vision path and the other feeds an absorption trap L9A, C25 tuned to accept the sound i.f. 38·15 MHz.

The third vision i.f. stage, TR3, has a wide-band collector load, L6A, tuned to mid band.

L6B and C52 form a sound i.f. rejector in series with the forward biased vision detector diode D1.

The video output is developed across R14 with the T trap L7, C20 tuned to reject the intercarrier frequency 3·5 MHz. L8 prevents the i.f. reaching the base of TR4.

Video Circuits

TR4 and TR5 form a long tailed pair; TR4 feeds the a.g.c. circuits and TR5 the output emitter follower TR6. R23 sets the forward bias on D1 and also the d.c. level at the emitter of TR6.

A.G.C. Circuits

With a positive modulation system, a.g.c. is derived from the signal level during the line suppression period as this is the only signal of constant amplitude that is transmitted. In this receiver, this is done by cancelling the sync pulses and then deriving a voltage from the signal level at blanking level.

A feed of the composite output signal at TR6 emitter has the picture components removed by TR9. The positive going sync pulses at the collector of TR9 are amplified and inverted by TR10 and d.c. restored by D5. They are then mixed at the base of TR11 with the positive syncs from the collector of TR4, leaving the blanking level as the most positive excursion of the signal. TR11 operates as an infinite impedance detector and develops an emitter potential proportional to the signal strength at blanking level.

If the signal input to the receiver increases, the potential across R14 increases positively and this change is applied to the base of TR4. The collector of TR4 moves negatively, carrying the base of TR11 with it. The emitter of TR11 follows, the time constant of R47 and C47 being suitable for the detection of rapid signal level fluctuations. The negative change is passed by the common base amplifier TR12 to TR13, the a.g.c. output transistor. The emitter potential of TR13 rises negatively, thus forward biasing i.f. stage TR1. The a.g.c. to the v.h.f. tuner stages is amplified, being taken from the collector circuit of TR1. This arrangement reduces cross modulation at the mixer stage with high level input signals.

R50 sets the d.c. level at TR13 emitter and thus controls the maximum sensitivity of the receiver. The adjustment is made during manufacturing tests and with no input to the receiver.

Sound Circuits

The sound i.f. signal in L9A is coupled via L9B to TR7, the first i.f. amplifier. The second sound i.f. amplifier, TR8, is coupled to the sound detector, D3, by the tuned transformer L11. The audio signal from the diode passes via the peak noise limiter, D4, to the output terminal.

The d.c. output from the diode across R37 provides some degree of a.g.c. for TR7.

Maintenance

Routine maintenance is not required and the settings of the various inductor cores should not be disturbed.

With the video output terminated in 75 ohms, the standing d.c. potential at the output should be −9 volts. This is adjusted by R23.

With an r.f. input signal, fully modulated with a composite video signal and at a level of 1 mV r.m.s., the video output should be 1 V p-p. This is adjusted by R49.

Note that the adjustment of R23 affects the setting of R49.

A circuit diagram is given inside the back cover of the receiver.

References

1. Designs Department Specification 8.284(68)
2. Designs Department Technical Memorandum 8.253(68)

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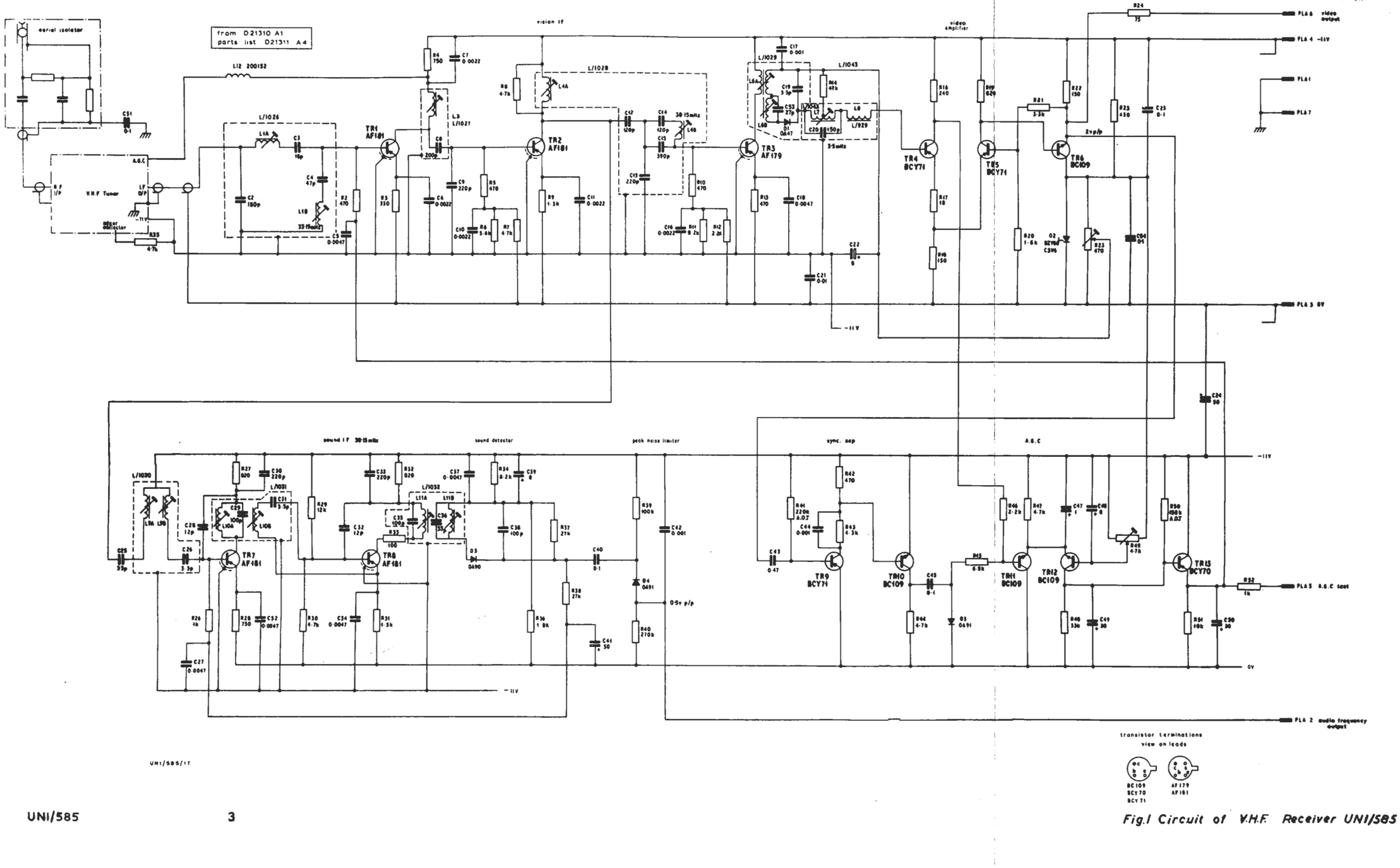
See overleaf for Fig. 1.



UNI/585/1T

Fig.1 Circuit of V.H.F. Receiver UNI/585