

CHROMINANCE/LUMINANCE PULSE AND BAR GENERATOR GE2M/559

Introduction

The GE2M/559 generates test waveforms necessary for the measurement of the transmission performance of circuits and apparatus designed to operate with 625-line colour signals and a sub-carrier frequency of 4.43 MHz. It replaces the Augmented Pulse and Bar Generator GE2M/543.

The GE2M/559 consists of the following four units mounted in a CH1/33 chassis:

GE4 516C Pulse and Bar Generator.

OS2/517 Fixed Frequency Modulated Oscillator.

GE2/561 (with sub-unit GE2/562) Pulse Timing and Auxiliary Waveform Generator.

PS2-13F Power Supplier.

Signal input and output connections are made via P.O. type 1C r.f. coaxial sockets. A CS2/11A carrying case is available for portable use.

The generated waveforms are composite and are as listed below; selection is made by means of a front-panel switch.

- (a) A line sawtooth.
- (b) A 50-Hz waveform consisting of a train of 50- μ s line bars switched on and off at 10 ms intervals.
- (c) A pulse-and-bar waveform containing chrominance/luminance components for the measurement of gain and delay inequality and for the measurement of chrominance-to-luminance crosstalk^{1,2}.

General Specification

Output (free running 1 volt p-p or field locked)

Output Impedance 75 ohms

Inputs

Mixed Syncs 2 volts p-p, high impedance

Mixed Blanking 2 volts p-p, high impedance

External 4.43 MHz Sub-carrier 1 volt p-p

Temperature Range 5°C to 45°C

Power Requirements about 8 watts at 240 volts, 50 Hz

Input Voltage Range 210-260 volts

Weight

Without Case 14 lbs

With Case 25 lbs

Dimensions

Without Case 10.5 in. $\times$ 5.25 in. $\times$ 14 in.

With Case 11 in. $\times$ 7.5 in. $\times$ 14.5 in.

General Description

Figs. 1, 2 and 3 show the block diagram, the circuit diagram and the complete chrominance/luminance test waveform respectively. Fig. 4 shows various waveforms for checking the performance of the unit.

The output signal, as selected by the front-panel

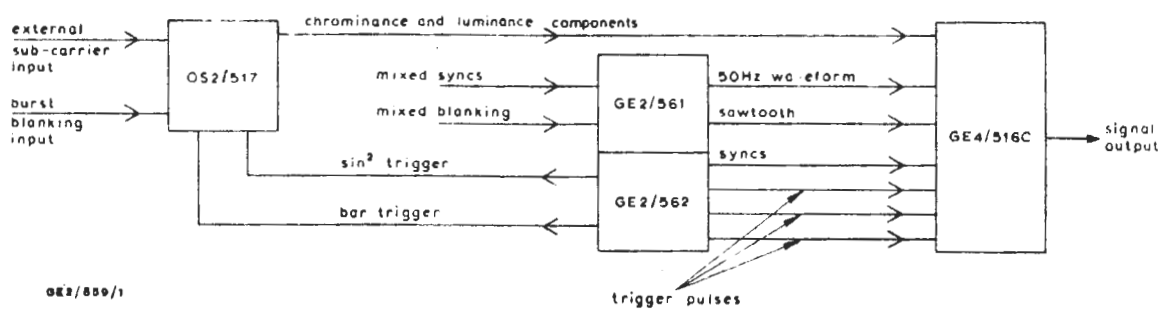
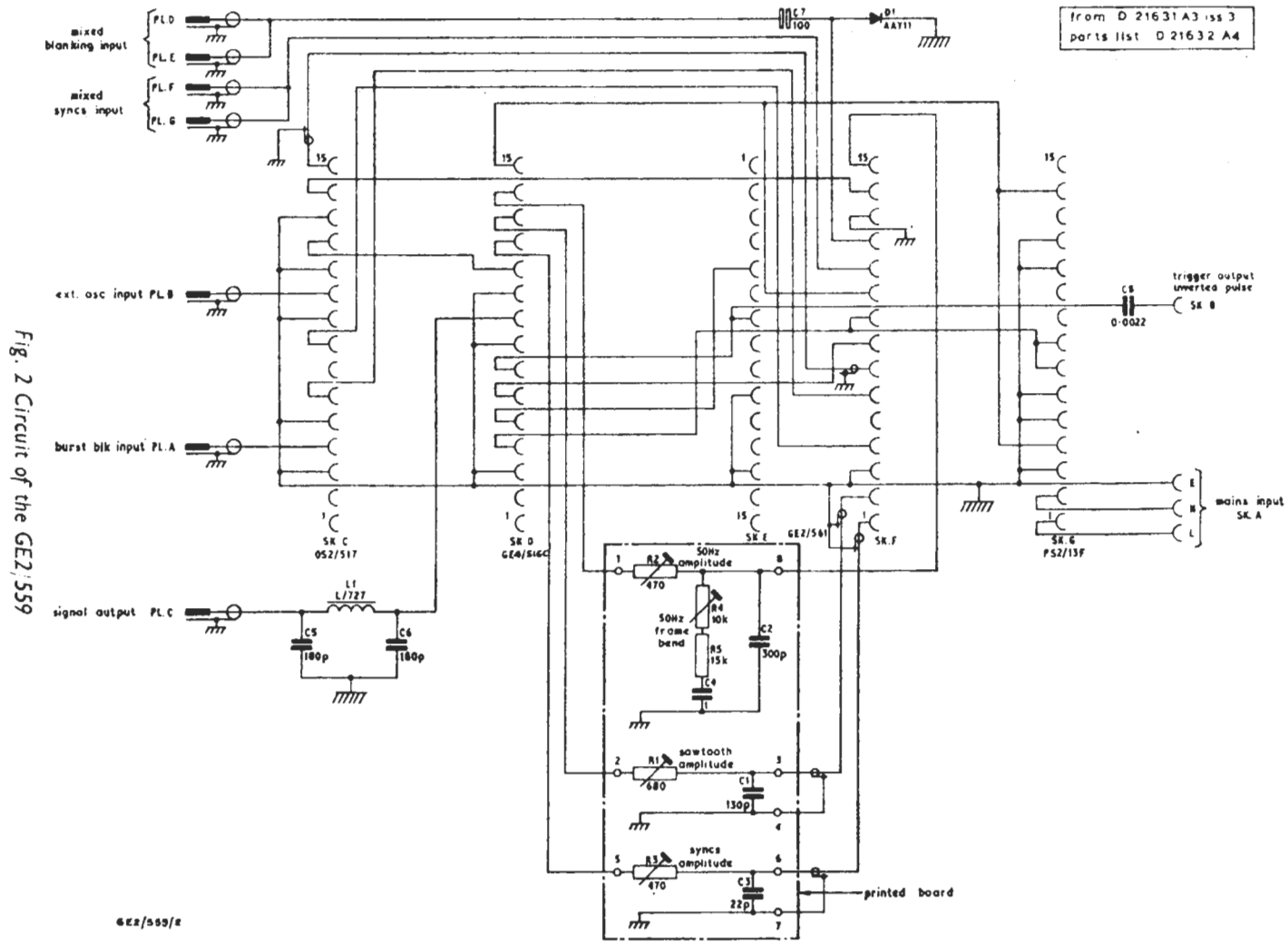


Fig. 1. Block Diagram of the GE2/559



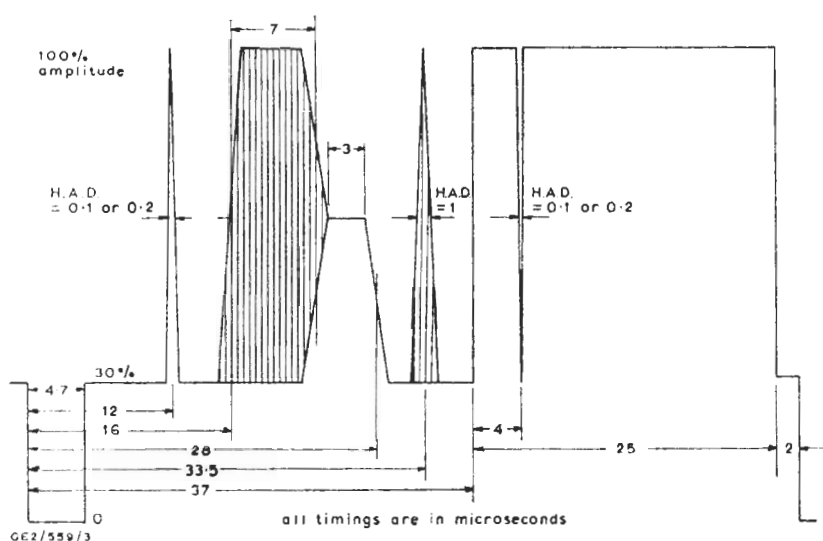


Fig. 3. Test Waveform Generated by the GE2/559

switch, can be a free-running line-repetitive waveform or it can be locked to field frequency. If locked, inputs of mixed-syncs and mixed-blanking are required. An internally or externally-generated source of 4.43 MHz can be used as convenient.

A burst, without phase alternation, may be produced by adding burst-gating pulses.

For applications where a mains power supply is not available, a PS2/48 mains/battery power supplier can be used as a plug-in alternative to the PS2/13F.

Maintenance

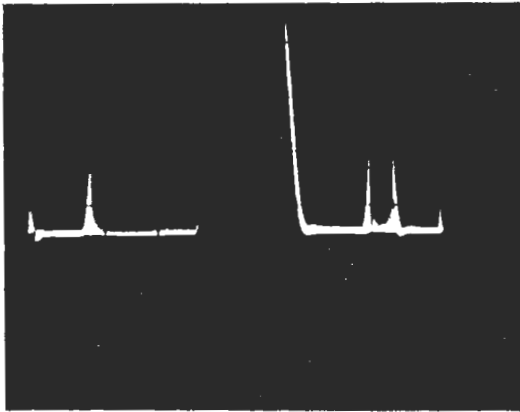
Routine maintenance is not required but the following checks should be made at six-monthly intervals using a suitable oscilloscope.

Connect the output of the GE2/559 to an oscilloscope via a UNI/511 signal-measuring set. Set the function switches to *int. syncs, pulse and bar, 2T, int. osc.* and set the *half-amplitude* switch to the *full amplitude* position.

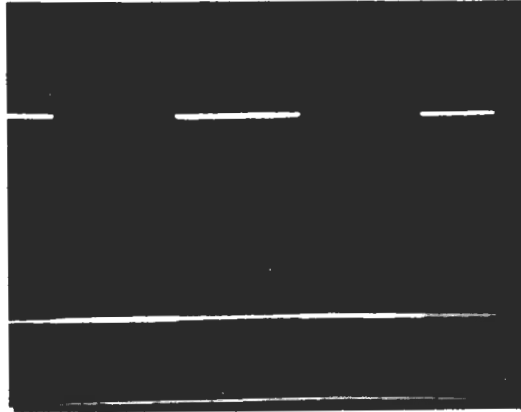
1. Check the shape of the 2T pulse and then the 1T pulse against Fig. 4d, the first overshoot should have an amplitude of 0.4% to 1.4%.
2. Check the shape of the luminance bar against Fig. 4c. There should be no appreciable exponential distortion at the corners and the top should be flat to within 0.2%.
3. Check that the complete pulse-and-bar waveform is as shown in Fig. 4c (and Fig. 4a). Any ripple on the base of the composite pulse

should be symmetrical about the base line and have an amplitude of less than 5 mV p-p. R106 (OS2/517) provides adjustment for luminance/chrominance gain equality. At optimum adjustment, the base line of the composite bar will have a sub-carrier excess of approximately 2 mV.

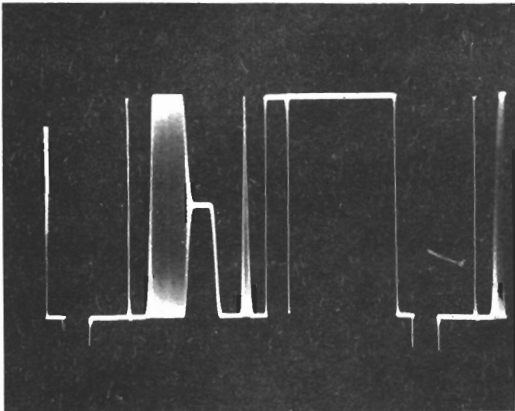
4. Check that the amplitudes of the composite pulse-and-bar waveform are equal to that of the luminance bar. R88 and R46 provide adjustment.
5. While observing the output from the GE2/559, switch the oscilloscope between the a.c. and d.c.-coupled conditions; the shift in the positions of the display should be less than 20 mV. RV3 in the GE4/516C provides adjustment.
6. The sync-pulse amplitude at the output should be exactly 0.3 V, and is set by R3 labelled *syncs* on the back panel of the GE2/559.
7. With the function switch on the GE2/559 set to 50 Hz and with the oscilloscope d.c.-coupled to the output, compare the displayed waveform with that of Fig. 4b. Adjust the *frame bend* control, R4, on the back panel to give an exactly square waveform. Adjust the amplitude of the bar to be 0.7 V by means of R2 labelled 50 Hz.
8. With the function switch set to *sawtooth*, the sawtooth amplitude should be 0.7 V. Adjustment is by R1 labelled *sawtooth*. See Fig. 4e.



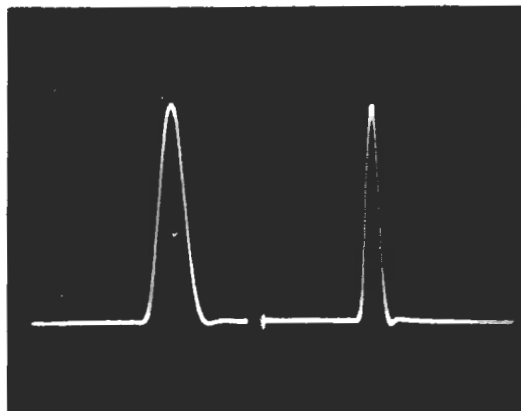
(a)



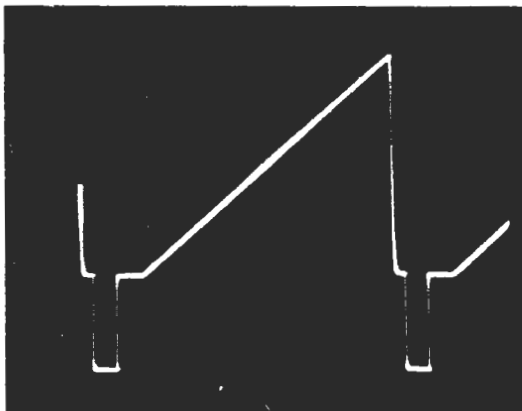
(b)



(c)



(d)



(e)

- (a) Composite components of chrominance pulse and bar.
- (b) 50Hz waveform.
- (c) Chrominance/luminance pulse and bar waveform.
- (d) 2T and T sine squared pulses.
- (e) Sawtooth waveform.

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Fig. 4 Waveforms In the Pulse and Bar Generator GE2/559

9. With a burst-gating pulse applied, the amplitude of the burst component should be 0.3 V p-p ± 0.015 V.
10. With an external supply of sub-carrier at 4.43 MHz, check that the base line of the composite pulse is correct as in (3) above. R11 in the OS2/517 provides adjustment.
11. Sub-carrier leak through the MD2/506 modulator in the OS2/517 should be less than 3 mV.

R18 in the OS2/517 is the modulator balance control.

References

1. B.B.C. Monograph No. 58.
2. Designs Department Technical Memorandum No. 9.81(67).
3. Designs Department Specification No. 9.93(68)
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