

COLOUR BURST DETECTOR AMPLIFIERS
AM3/506 and AM3/506A
AM3/507 and AM3/507A

Introduction

These units each accept a colour video signal at standard level and, when the colour burst is not present on that signal, two relays (in the AM3/506 series) are energised within the unit (or one relay in the AM3/507 series). The relay contacts are available to perform external switching operations. The AM3/506 and AM3/506A must be used only for video signal routing; the AM3/507 and AM3/507A must be used where d.c. signal routing is required.

The AM3/506 and AM3/507 are designed for use with 625-line PAL signals; the AM3/506A and AM3/507A are designed for use with 525-line NTSC signals.

Each unit carries a star indicator on the front panel to indicate a detected burst and a push button *Press to Test +12 V* which also operates the indicator. Each unit includes a PS2/22B Power Supplier and is constructed on a CH1/12A chassis. The AM3/506 series use index pegs 7 and 41 and the AM3/507 series use index pegs 8 and 36.

<i>Signal Input</i>	colour video signal at standard level ± 3 dB
AM3/506, AM3/507	625-line PAL (4.43-MHz subcarrier burst)
AM3/506A, AM3/507A	525-line NTSC (3.58-MHz subcarrier burst)

Input Impedance high-impedance bridging

Distortion (bridged circuit)

Differential Phase	less than 0.1 degree at subcarrier frequency
Differential Gain	less than 0.1% at subcarrier frequency

Operating Level (nominal) above -6 dB colour burst w.r.t. 0.3 V p-p

Tolerable Noise (during back porch)

Peak-to-peak signal to unweighted noise ratio	not greater than 26 dB
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Relay Switching as shown on the circuit diagrams in Figs.1 and 2

Mains Input 230 to 250 V a.c.

Temperature Range 10° to 40°C ambient

Weight 0.9 kg (2 lb 1 oz)

Circuit Description (AM3/506 and AM3/506A)

The circuit diagram of the AM3/506 and AM3/506A is given in Fig. 1.

Video enters the unit on PLA12, is amplified by TR1,TR2 and passed via C2 to feed two signal paths. One generates gate pulses; the other drives the burst detector to energise the relays.

Gate Pulse Generation

The amplified colour video signal from C2 feeds TR10 which has a subcarrier-rejector circuit parallel-tuned to 4.43 MHz (3.58 MHz) in its emitter circuit. Inverted luminance at 3.6 V p-p is passed by emitter follower TR11 to the clamp and sync separator circuit TR12,TR13.

Sync tips at the clamp input are d.c.-restored to about 1 V by the diode D9. Transistor TR13 is turned on for the duration of syncs to generate 9-V p-p negative-going mixed syncs at the collector. The leading edge of these syncs is differentiated by the short time-constant C26,R43 to turn on TR12 which clamps the start of the sync pulse to about 0.75-V.

The trailing edge of syncs from TR13 trigger the gate-pulse generator TR14,TR15, an emitter-coupled monostable, which gives 7-V p-p positive-going pulses of about 3.7- μ s duration.

Burst Detection

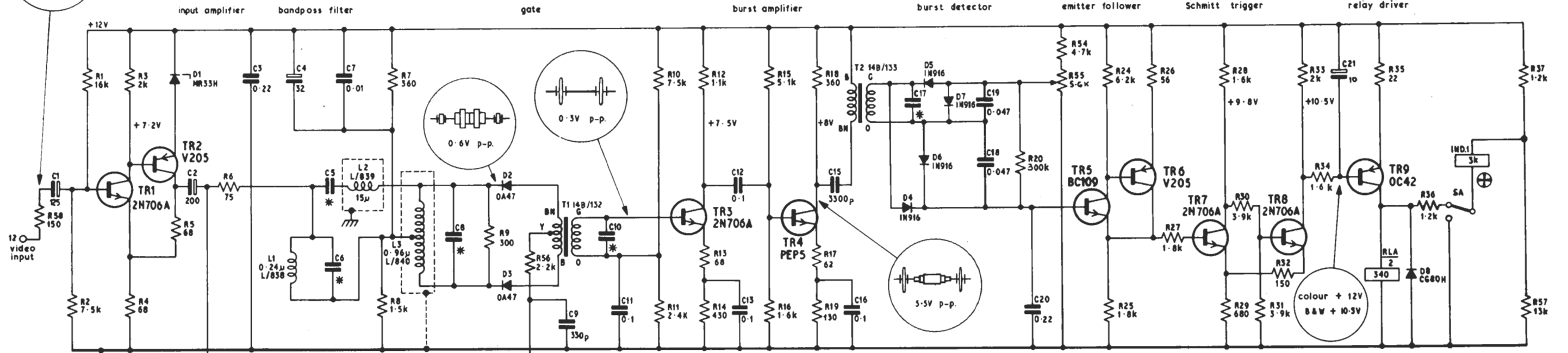
Amplified colour video from C2 is also fed to a bandpass filter accepting the appropriate subcarrier and sidebands and rejecting luminance information. The *earthy* side of the parallel-tuned rejector L1,C6 is returned to the centre-tap of the tuned auto-transformer L3 which is biased by R7,R8 to about 9.6 V. Gate pulses from TR15 turn on the diodes D2 and D3 for the duration of the colour burst; the bias from R7,R8 ensures that they are cut off for the remaining period.

The gated burst at 0.3 V p-p from the tuned transformer T1 is amplified by two common-emitter stages TR3,TR4 to 5.5 V p-p. This signal feeds the transformer T2 which drives a voltage doubler from the tuned secondary. A detected signal makes the junction of D4,D6 go positive and the junction D5,D7 go negative. The positive output is integrated by C20, an adjustable bias is added from R55 and the sum voltage passed by the compound emitter follower TR5,TR6. TR6 feeds a Schmitt trigger circuit TR7,TR8 which operates the relay drivers TR9,TR16. Transistor TR9 operates RLA directly, whereas TR16 has an added time constant (determined by C29) in its operation of RLB.

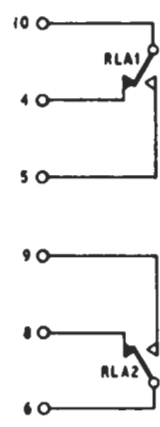
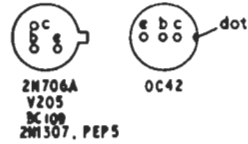
A star indicator IND1 normally operates when a burst is detected, but it can be switched by SA *Press to Test +12 V* to show correct operation of the power supply.

Power Supply

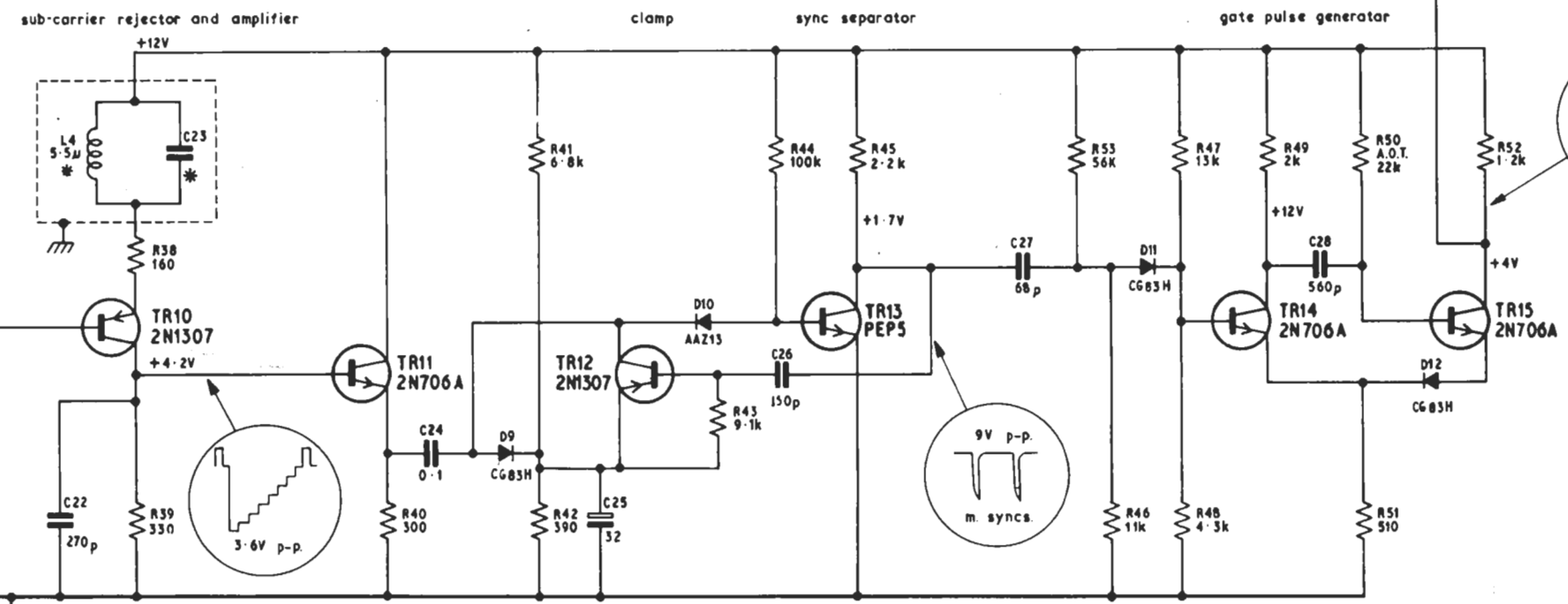
Power at +12 V is provided by a PS2/22B Power Supplier integral with the unit.



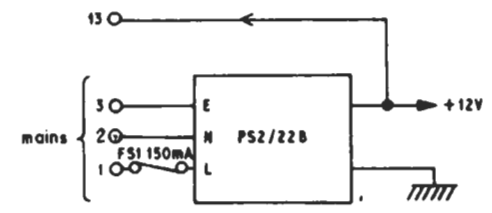
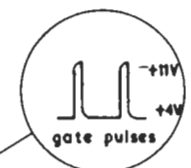
transistor terminations view on leads



pins 7, 11, 15
AM3/507/1



from D19438 A2 iss. 5
parts list D19439 A4



* component values in pF	AM3/507	AM3/507A
C5	91	130
C6	5100	7500
C8	1300	2000
C10	24	36
C17	12	27
C23	270	390
L4	L/B41	L/B45

Note: All voltages measured with Avometer model 8, with no input signal to the unit.

Circuit Description (*AM3/507 and AM3/507A*)

The circuit diagram of the AM3/507 and AM3/507A is given in Fig. 2. Component numbering follows that of the AM3/506 and AM3/506A wherever possible.

Operation of these units is identical to that of the AM3/506 except that only one relay is used (driven by TR9) carrying double-pole changeover contacts all of which are made available on the rear connector.

Colour Burst Level Recording

Modifications are described in reference 4 which allow the AM3/506 or AM3/507 to drive a pen recorder and thereby monitor colour burst amplitude over a 14-dB range. Use in this mode precludes external circuit switching by the relays.

Alignment*Equipment*

- Avometer model 8
- Tektronix 515 Oscilloscope, or equivalent
- X10 Attenuator probe
- Feed of standard level colour video signal of the appropriate line standard
- 6-dB Video Attenuator
- Extender board, CH1A/3

Procedure

1. Plug in the unit via the extender board. Switch on mains, depress the button *Press to Test +12 V* and check that the star indicator opens.
2. Measure the voltage from the power supply; adjust to 12.0 V ± 0.1 V.
3. Connect and terminate the video signal at the unit input. Monitor the line-rate signal at TR10 collector and adjust the core of L4 for maximum subcarrier rejection.
4. Monitor the line-rate pulses at TR15 collector; the amplitude should be about 7 V p-p and the half-amplitude duration should be $3.7 \pm 0.3 \mu\text{s}$. Adjust R50 on test to give this duration; (values within 25% of nominal are usual). Check that line pulses are present throughout the whole field period.
5. Monitor the signal at TR4 collector and adjust the cores of L1, L2 and L3 to give a maximum level of gated burst. (An excessive level of break-through of video or gate pulses indicates a fault.)
6. Measure the voltage on the slider of R55 and adjust to give 2V w.r.t. chassis.
7. Measure the voltage at TR6 collector and adjust the cores of L1, L2, L3, T1 and T2 to give a maximum positive potential.
8. Remove the input signal and check that the voltage at TR6 collector drops by at least 4 V. Reconnect the input signal via the 6 dB attenuator and adjust R55 until the star indicator on the front panel just opens. Remove the attenuator and extender board and restore the unit to its normal position.

Maintenance

No routine maintenance is possible. Waveforms and voltages are given on the circuit diagrams to assist fault location.

References

1. AM3/506,A: Designs Department Technical Specification 11.24(66)
2. AM3/507,A: Design Department Technical Specification 11.25(66)
3. Designs Department Technical Memorandum 11.31(66)
4. Designs Department Technical Memorandum 11.40(67)

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