

LUMINANCE UNIT UN19/502, UN19/502B AND MODIFIED VERSION FOR F/S STANDARDS CONVERTER

Introduction

This unit accepts inputs of RGB picture signals, the luminance signal (where appropriate) and the chrominance signal of a colour television system and a feed of mixed sync pulses. The output is a complete composite 625-line coded colour video signal at standard level.

The unit is constructed on three printed-wiring boards on a Type CH1/12B Chassis (index-peg positions 23, 24). The front panel carries a five-position *Luminance* switch and a pre-set *Sync Amp* control. The switch connects the input of the unit either to the RGB picture signals from a resistance matrix in the unit or to the luminance signal.

On another position of the switch, external relays are operated to substitute colour-bar test signals for the RGB signals. Both the *Bars* and *Picture* ranges of the switch include luminance *Off* settings. The amplitude of the mixed sync pulses added to the picture signal in the unit is adjustable by means of the *Sync Amp* control.

The UN19/502 is used as part of the PAL Colour Coder GE1/526, and the UN19/502B as part of the NTSC Colour Coder GE1/521B (C.C.I.R. Systems I and M respectively). The circuits of the two versions are the same; only the component values of the linear phase filter and the length of the delay line are different, as shown by the table in Fig. 1.

General Specification

<i>Supply Potential</i>	+12 V
<i>Input-signal Amplitudes</i>	
RGB and luminance signals	0.7 V p-p
Chrominance signal	4.4 p-p
Mixed sync pulses	2 V p-p
<i>Input Impedance (minimum)</i>	
RGB and luminance signals	greater than 1.5 kilohms
Chrominance signal	greater than 5 kilohms
Mixed sync pulses	greater than 3.3 kilohms
<i>Output-signal Amplitude</i>	1 V p-p
<i>Output Impedance</i>	75 ohms

Circuit Description

The circuit of the unit is given in Fig. 1. The incoming RGB signals are combined by R_1 to R_4 and the input impedance of TR1 in the appropriate proportions to satisfy the equation

$$Y = 0.299R + 0.587G + 0.114B$$

where Y is the luminance signal. When a four-tube picture source is used, the luminance signal is directly available for selection by SA as an alternative to that derived from the RGB signals.

The amplifier TR1 to TR3 has a low-impedance output suitable for feeding the delay-line DL1 via R15. Some variation of gain is possible by adjustment of the pre-set control RV1 on the upper printed-wiring board of the unit.

At the input to the delay line, the mixed sync pulses are added to the luminance signal after clipping and amplification by TR4 and TR5. As a result of the clipping, the amplitude of the pulses as set by RV2 is independent of any variations in amplitude of the incoming pulses. RV2 is the *Sync Amp* control on the front panel of the unit.

The delay cable introduces into the luminance-signal chain a delay equal to that undergone in the chrominance unit by the chrominance signal.

The amplifier TR6 to TR8, which closely resembles TR1 to TR3, feeds a linear-phase filter electrically similar to the filter Type FL4/508. At the input to this filter the incoming chrominance signal, including colour burst, is combined with the luminance signal so that the output from the unit is a complete coded colour video signal.

Maintenance

Because this is one of a group of interdependent units it is not replaceable by other examples of the same unit type; it must always be aligned as described below in association with the other units of the parent equipment, preferably on their permanent panel. The following alignment procedure assumes that the other units are already aligned.

Apparatus Required

Cathode-ray oscilloscope with 50 mV/cm Y-Plate sensitivity, 10 MHz bandwidth, time-base scale adjustable to 1 μ s/cm, differential facility and fitted with high-impedance probe.
Video oscillator covering frequency range

100 kHz—10 MHz (e.g., Wayne Kerr Type 022B).

The parent panel of the unit (GE1M/526 for UN19/502, GE1/521B for UN19/502B) with complement of other units already aligned.

Feeds of 100% colour-bar RGB components. Feeds of mixed sync and colour-burst gating pulses 2-volt p-p., each loaded with 75 ohms externally to the panel.

Feed of PAL square-wave signal 1-volt p-p loaded with 75 ohms externally to the panel.

A.C. Mains supply.

Test Procedure

1. Plug the unit into the panel of the parent unit and connect the signal feeds detailed above, plugging the colour-bar signals to the top three *Picture* input connectors to avoid the need for a relay-operating supply.
2. Using the oscilloscope probe, check that all the incoming signals appear with the correct amplitudes at the appropriate monitoring points on the units of the panel.
3. Using the differential facility of the oscilloscope, check that the colour-bar amplitudes at the *R*, *G* and *B* monitoring points on the unit are the same; i.e. 0.7 volt p-p.
4. Connect the mains supply to the panel and measure the potential with respect to chassis at the positive side of C9; this should be 12 volts. If it is not, check the potential at the positive side of C4 in the Power and Subcarrier-processing Unit UN1/549 and adjust it to 12 volts by means of RV1 in that unit.
5. Using the oscilloscope probe, examine the signal at the junction of R23 and the delay cable and check that it consists of pulses of amplitude varying between 0.25 volt and 0.4 volt p-p as the *Sync Amp* control RV2 is rotated throughout its range.
6. Using the oscilloscope probe, examine the signal at the negative side of C8 and set the amplitude of the picture component to 0.7 volt p-p by means of RV1.
7. Connect the video oscillator to PLD of the panel (the lowest of the *Picture* connectors) and set the *Luminance* switch on the unit to *Ext (4T)*.
Connect the oscilloscope to PLH of the panel

(the *Coder Output* connector) using a coaxial lead loaded with 75 ohms at the instrument. Using a sinusoidal oscillator-output signal, set to an amplitude of 0.5 volt p-p, check the frequency response of the unit which should be within ± 1 dB at 6 MHz. If the response is not satisfactory, the entire panel with its units must be returned to Equipment Department for servicing. No attempt must be made to adjust the variable components of the linear-phase filter.

8. Perform the routine alignment of the parent unit before returning it to service.

Modified Luminance Unit UN19/502 (165)

The modified UN19/502 is for use in the Field-store Standards Converter CO6/506. It accepts the *R*, *G* and *B* colour-separation signals (a separate luminance signal is not available), and a feed of subcarrier (quadrature-modulated with *R-Y* and *B-Y* colour-difference signals) from a modified UN18/503 Chrominance Unit (key ref. 164). From these input signals, the UN19/502 produces a non-composite 625-line colour-coded video signal at 0.875 volts p-p (for 95-per cent colour bars).

The unit forms part of the Intermediate-signal coding equipment contained in the input section of the CO6/506. In the converter, the coded Intermediate Signal is used to frequency modulate a 30-MHz carrier which is then subjected to various delaying and switching processes in the interpolation and field-store circuits.

The address of the modified UN19/502 in the CO6/506 equipment is 1/9/8 (see block diagram C).

The specification given for the unmodified UN19/502 is applicable to the modified unit. Note however that, although mixed-sync pulses are fed to this unit, they are not used.

Circuit Modifications

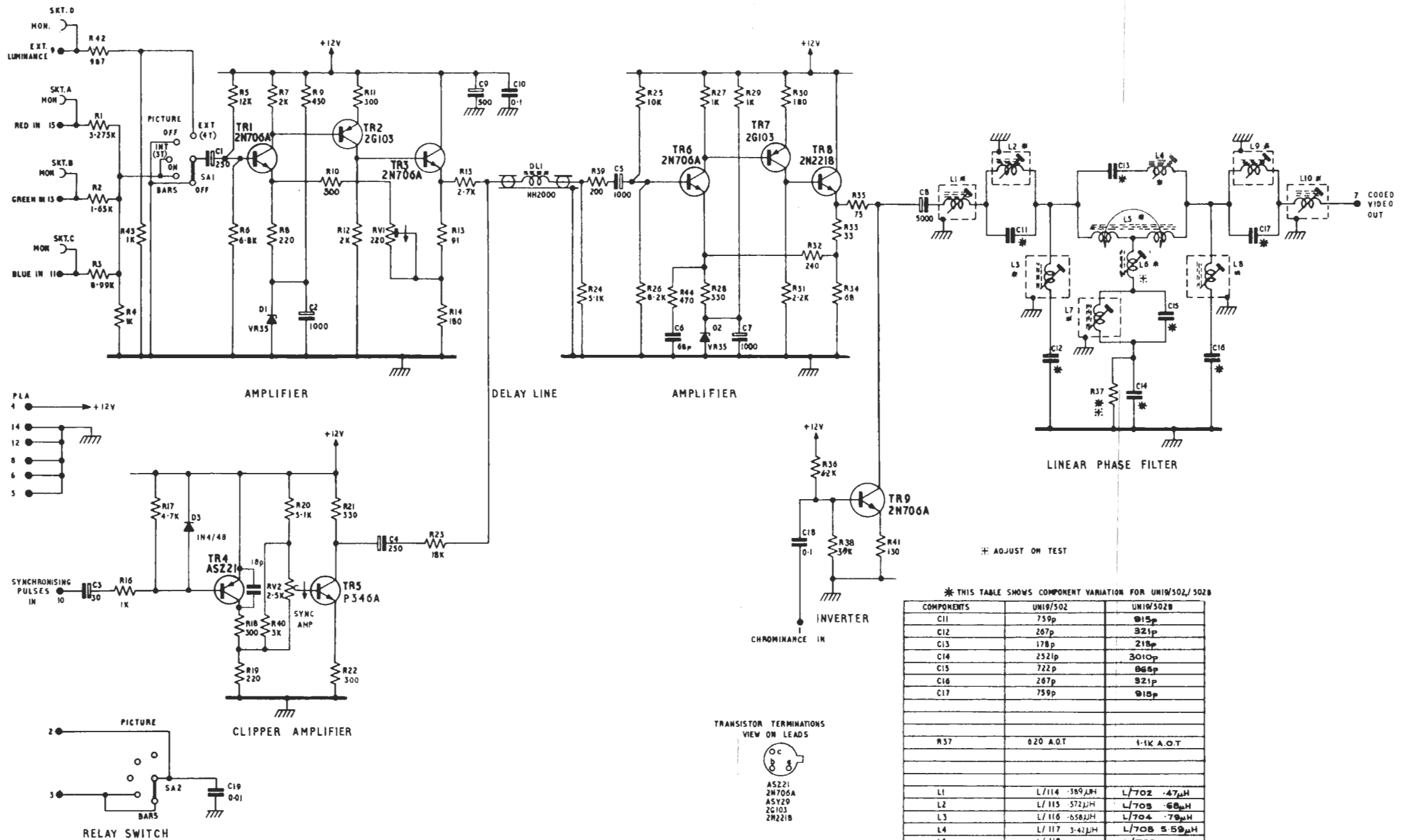
Resistor R23 (18 kilohms) is removed so preventing the addition of mixed-sync pulses to the luminance-signal output from TR3.

References

1. Designs Department Technical Memorandum No. 8.169(64).
2. Designs Department Specification No. 8.198(65).

JHH, DEH, JN 4/69

from DG 14454 iss 7
parts list DA 14455



⊕ ADJUST ON TEST

* THIS TABLE SHOWS COMPONENT VARIATION FOR UNI9/502/ 502B

COMPONENTS	UNI9/502	UNI9/502B
C11	759p	915p
C12	267p	321p
C13	178p	218p
C14	252ip	3010p
C15	722p	866p
C16	267p	321p
C17	759p	915p
R37	0.20 A.O.T	1-1K A.O.T
L1	L/114 389μH	L/702 47μH
L2	L/115 572μH	L/703 68μH
L3	L/116 658μH	L/704 79μH
L4	L/117 3.42μH	L/705 5.59μH
L5	L/118	L/706
L6	L/119 A.O.T	L/707 A.O.T
L7	L/120 1.02μH	L/708 1.25μH
L8	L/116 658μH	L/704 79μH
L9	L/115 572μH	L/703 68μH
L10	L/114 389μH	L/702 47μH
DL1	DA14467 DET 10	DA14467 DET 11

