

CODER CALIBRATORS UN2M/505 AND UN2L/505

Introduction

These electrically identical units are used (in conjunction with a high-grade oscilloscope such as the Tektronix 535A) to align NTSC and PAL coders without using a vectorscope, and also to check the calibration of colour bar generators. Additionally, the units can be used to calibrate the associated oscilloscope.

The signal parameters which can be checked are:

- (a) Luminance signal amplitudes (PAL and NTSC).
- (b) PAL chrominance signal amplitudes (B-Y signal 0.612 volt, R-Y signal 0.861 volt).
- (c) NTSC chrominance signal amplitudes (I signal 0.839 volt, Q signal 0.728 volt).
- (d) NTSC relative phase (the 90° phase difference between the I and Q axes).

Note. When aligning a PAL coder, the 90° phase difference between the two axes is established by reducing any difference in the amplitude of corresponding chrominance components on adjacent lines to zero; i.e. by reducing chrominance amplitude twitter to a minimum.

The UN2M/505 consists of two sub-units, a Colour Calibrator UN2/503A and a Synchronous Detector and Amplifier AM1/549 mounted in a CS2/13A carrying case; these units and their sub-units are shown in Fig. 1.

The UN2L/505, which consists of the same sub-units mounted in a PN3/23 chassis, is suitable for bay mounting. Power supplies, for both sub-units, are derived from the UN2/503A which has an integral power supply. Consumption from the 240-volt mains is about 6 watts.

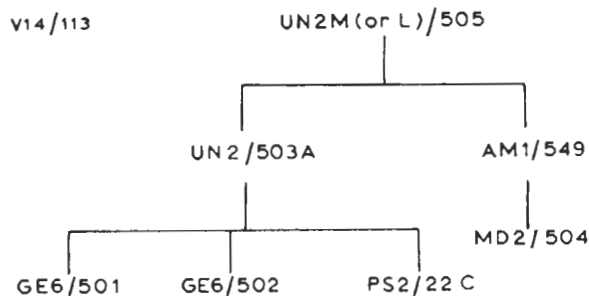


Fig. 1 Component Units of the UN2/505

Operation

Four modes of operation are selected by a switch on the front panel of the AM1/549 sub-unit. These are: *Calibrate*; *Measure Amplitude*; *Set on Q* and *Adjust I*. When colour bar generators are aligned the output is taken from the UN2/503A sub-unit and does not pass through the AM1/549.

A block diagram, which shows the signal paths for each mode of operation, is given in Fig. 2.

(a) Calibrate

With the selection switch in this position the output of the UN2/503A passes straight through the AM1/549 to the output of the unit and so all the Colour Calibrator facilities are available to check the response of the associated oscilloscope.

(b) Measure Amplitude

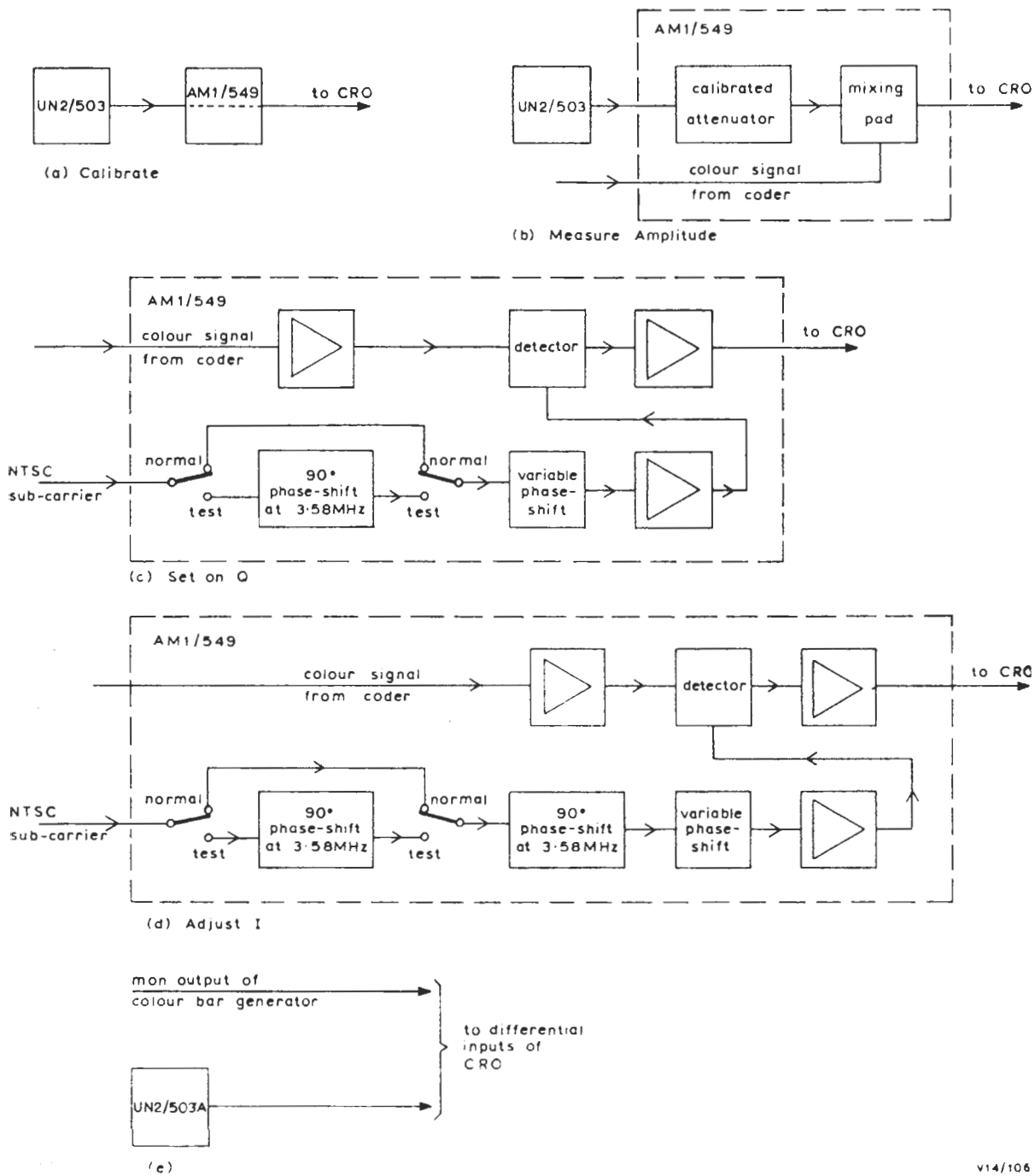
The output of the UN2/503A is applied, via a calibrated attenuator, to a mixing pad which is also fed with the output of a coder. By selecting the appropriate output from the UN2/503A and setting the calibrated attenuator to the required position the amplitude of the luminance, separated chrominance, burst and sync components of the coder output can be measured.

(c) Set on Q

The output of the coder is applied to a synchronous detector. The detector is fed also with NTSC sub-carrier, via a variable phase-shift network. With the coder output switched to *Q* the variable phase-shift network is adjusted for zero output signal.

(d) Adjust I

The interconnections for this mode of operation are similar to those for *Set on Q* but the sub-carrier is phase-shifted by 90° before being applied to the variable phase-shift network. The coder output is switched to *I* and so this also is phase-shifted by 90° . Thus the chrominance amplitude, as seen on the oscilloscope, should still be zero. If it is not, the *Set 90* control on the coder must be adjusted. Do not alter the setting of the variable phase-shift network in the AM1/549 when checking this parameter as a serious error would result.



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Fig. 5.2 Block Diagram of a Coder Calibrator Showing Modes of Operation

(e) *Calibration of Colour Bar Generators*

For this operation an oscilloscope with differential measuring facilities must be used.

The square-wave output of the UN2/503A is applied to an unterminated input on the difference amplifier and the monitor output of the colour-bar generator is applied to the other input, which is also unterminated. The colour-bar generator is then aligned in the normal way to give zero output on the oscilloscope.

Maintenance

The *Test/Normal* switch on the backplate of the AM1/549 amplifier enables the accuracy of the 90-degree phase-shift networks to be checked. To do this proceed as follows:

1. With the *Test/Normal* switch at *Normal* and the mode selection switch at *Set on Q* adjust for zero signal amplitude on the oscilloscope display as detailed in (c).
2. Put the *Test/Normal* switch to *Test* and the mode selection switch to *Adjust 1* (The coder output should still be switched to *Q*). This shifts the phase of the sub-carrier input to the amplifier by 180° and so the detector output, as seen on the oscilloscope, should still have zero amplitude. (An amplitude of up to 15 millivolts, excluding transients, is permissible.) If the output does not fall within the permitted tolerance the characteristics of one or both of the phase-shift networks have altered and the unit should be returned to Equipment Department for re-alignment.

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