VECTOR DETECTOR UNITS UN20L/508 AND UN20L/508A

Introduction

These units both extract colour information from coded colour signals for display as vectors on an associated oscilloscope. The UN20L/508 accepts PAL signals and the UN20L/508A unit, described at the end of this Instruction, accepts NTSC signals.

General

The UN20L/508 accepts one or two coded PAL colour signals and provides the colour vector information in a form which produces a polar-co-ordinate display on an oscilloscope[1,2]. The colour signals are demodulated using a subcarrier signal, which can either be fed to the unit from an external source or regenerated within the unit from the A-input signal.

The unit consists of the following plug-in sub-units mounted on the parent chassis:

PAL Vector Switch Unit UN9/542
PAL Vector Demodulator DM1/502
Sync Separator Unit UN1/540

The circuit diagram showing the interconnections between the sub-units is given in Fig. 1.

General Specification (UN20L/508)

A and B input levels	Standard level
A and B input impedances	75 ohms
Subcarrier input level	Standard level
Subcarrier input impedance	75 ohms
7·8 kHz input level	1 volt p-p
7·8 kHz input impedance	75 ohms
Subcarrier frequency	4·43361875 MHz
Operating temperature	0–50°C
Mains input	240 volts ± 10%
Power consumption	10 watts
Weight	3·5 lb.

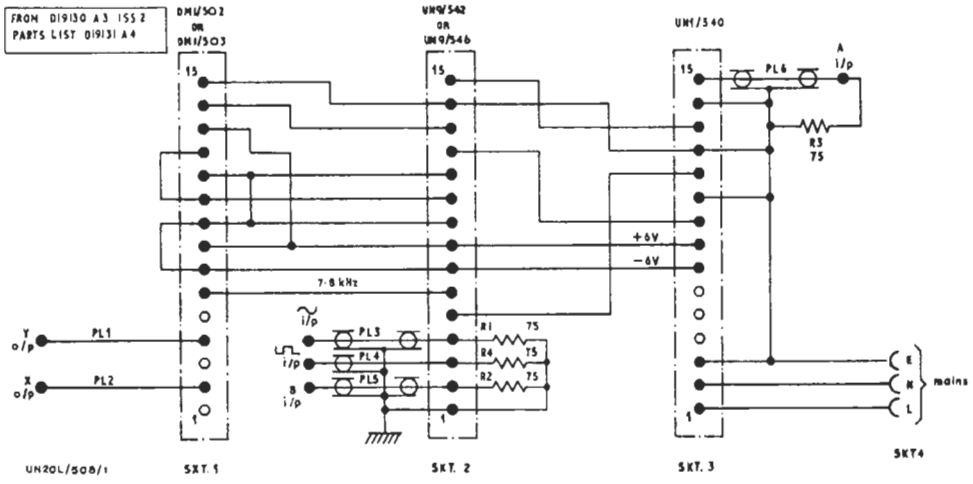

Fig. 1 Circuit of Vector Detector Unit UN20L/508

Alignment and Operating Procedure (UN20L/508)

When the UN20L/508 forms part of a MN6M/504 Vector Waveform Monitor, it is aligned in accordance with the instructions given for that Monitor. However, when used in conjunction with a separate oscilloscope it should be aligned in accordance with the instructions given below.

The majority of these instructions apply also to the UN20L/508A, the main difference being that this unit does not contain the two 7·8-kHz switches.

Setting Up the Display

1. Apply signals and power to the unit and connect the X and Y output points to a suitable oscilloscope (one with direct-coupled X and Y amplifiers and a vector graticule) in which the timebase has been switched off.
2. Switch on and allow five minutes to warm up.
3. Adjust the *Brightness* and *Focus* controls on the oscilloscope to obtain a focused spot of the required intensity and then adjust the *X* and *Y* shift controls to position the vector-origin spot in the centre of the graticule.
4. Set the mode switch to *A+0*, the subcarrier switch to *Sinewave Int* and the 7·8-kHz switches to *Squarewave On* and *Squarewave Int*. Note that the internal reference signals are derived from the A input to the unit.
5. Adjust the *B Gain*, *X Gain* and *Quadrature* controls until the two ellipses displayed on the oscilloscope merge into a single circle which is aligned with the test circle inscribed on the graticule.
6. Rotate the *Phase* control to position the reference burst in the first quadrant of the circle inscribed on the graticule. Check the position of the test circle and readjust the *Quadrature* control if necessary.

Note: If the reference burst does not appear in the correct quadrant, reverse the graticule or change over the signals applied to the X and Y plates of the oscilloscope.

7. Adjust the *A Gain* control until the amplitudes of the displayed vectors are the same as those inscribed on the graticule.
8. Set the mode switch to *A+B* and adjust the *B Gain* control until the amplitudes of the B-display vectors are the same as those inscribed on the graticule.

Subcarrier Phase Comparison (Internal Reference)

1. Carry out step 4 above.
2. Set the mode switch to *A+B* and compare the B-signal reference burst with the A-signal reference burst.

Subcarrier Phase Comparison (External Reference)

1. Set the subcarrier switch to *Sinewave Ext*, the 7·8-kHz *Int/Ext* switch to *Squarewave Ext* and the mode switch to *A+0*. Adjust the *Phase* control to align the burst to the graticule.
2. Apply the signal (to be compared) to the A input of the unit in place of the original A signal. Compare the reference burst of this signal with the burst position inscribed on the graticule. The angle of error of the second signal can be read from the graticule. If it is required to bring the two signals into phase then the phase of the colour-bar generator from which the second signal is derived must be adjusted until the reference burst is aligned with the burst inscribed on the graticule.

Phase Comparison (7·8 kHz)

If, during the subcarrier tests, the reference burst appears in the second or fourth quadrant of the display the phase of the 7·8-kHz signal is incorrect.

Phasing (7·8 kHz)

1. Carry out step 4.
2. Set the 7·8-kHz switch to *Squarewave Ext*. If the two signals are in phase the phase of the reference burst will not change.

UN20L/508A

The unit differs from the UN20L/508 in the following respects:

(a) NTSC Vector Switch Unit UN9/546 replaces PAL Vector Switch Unit UN9/542
(b) NTSC Vector Demodulator DM1/502 replaces PAL Vector Demodulator DM1/502
(c) The sub-carrier frequency becomes 3·579545 MHz.

Reference to Typical Associated Equipment

1. Vector Display Unit UN12/502.
2. Vector Waveform Monitor MN6M/504.

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