

VISION DEMODULATOR DM2/506

Introduction

The DM2/506 is a synchronous vision demodulator which accepts a 37.5-MHz vision i.f. carrier and a burst signal also at 37.5 MHz. There are two outputs: a video signal and an error signal proportional to any phase difference between the burst signal and an internally generated 37.5-MHz signal.

The unit is built on a printed board and mounted in a CH1/39A chassis with index pegs 47 and 57. The inputs and the video output connections are via BNC sockets on the front panel. The d.c. supplies and the error signals connections are made through a 15-way rear-mounted Painton plug.

The unit was designed as part of the RC5M/502 U.H.F. Rebroadcast Television Receiver,

General Specification

Input Levels

Vision I.F. Signal	50 mV r.m.s.
Burst Signal	300 mV p-p

Video Output Level 10 mV p-p

Power Requirements 220 mA at +12 V
130 mA at -12 V

Weight 2 lb

Circuit Description

The circuit is given in Fig. 1. The unit consists basically of two sections, a synchronous demodulator and a phase-difference detector for comparing the 37.5 MHz of the burst signal with the 37.5 MHz of the local oscillator.

TR1 is the crystal-controlled local oscillator. The output from the oscillator is split by the pad R5R6R7R35 to feed the two sections of the unit.

TR2 is a buffer stage feeding the low-impedance input to the common-base tuned amplifier TR3. TR4 provides current drive to the demodulator bridge. The vision signal is fed to the bridge via C18 and the output video is developed across R25. The output low-pass filter removed unwanted signals.

When the complete receiver system, of which this unit forms a part, is locked to the local oscillator TR1 the inputs to the demodulator bridge are in phase; R9, C7 and L4 help to achieve this condition.

The error-signal circuits form the second half of the unit and are similar to those of the demodulator. The two inputs to the bridge are 37.5 MHz derived from the local oscillator (TR1) and the burst signal. The

burst consists of 2- μ s pulses of 37.5 MHz during each line-sync period. When the system is locked, there is nominally 90° between the two signals; the network R45,L8,C29 is set to ensure this.

In the unlocked condition, the output of the bridge consists of a burst of pulses of 37.5 MHz occurring at line frequency. The amplitude of these pulses varies according to the degree of phase shift between the input signals and so the polarity of the pulses (i.e. positive or negative going) depends on whether the vision signal leads or lags on the local oscillator signal.

In the locked condition, the two 37.5-MHz signals have the same frequency but are very slightly out of phase with each other. The resulting error signals have just sufficient amplitude to retain control.

IC1 is an amplifier feeding the error signals to the output terminals.

Maintenance

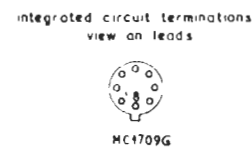
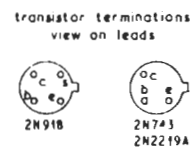
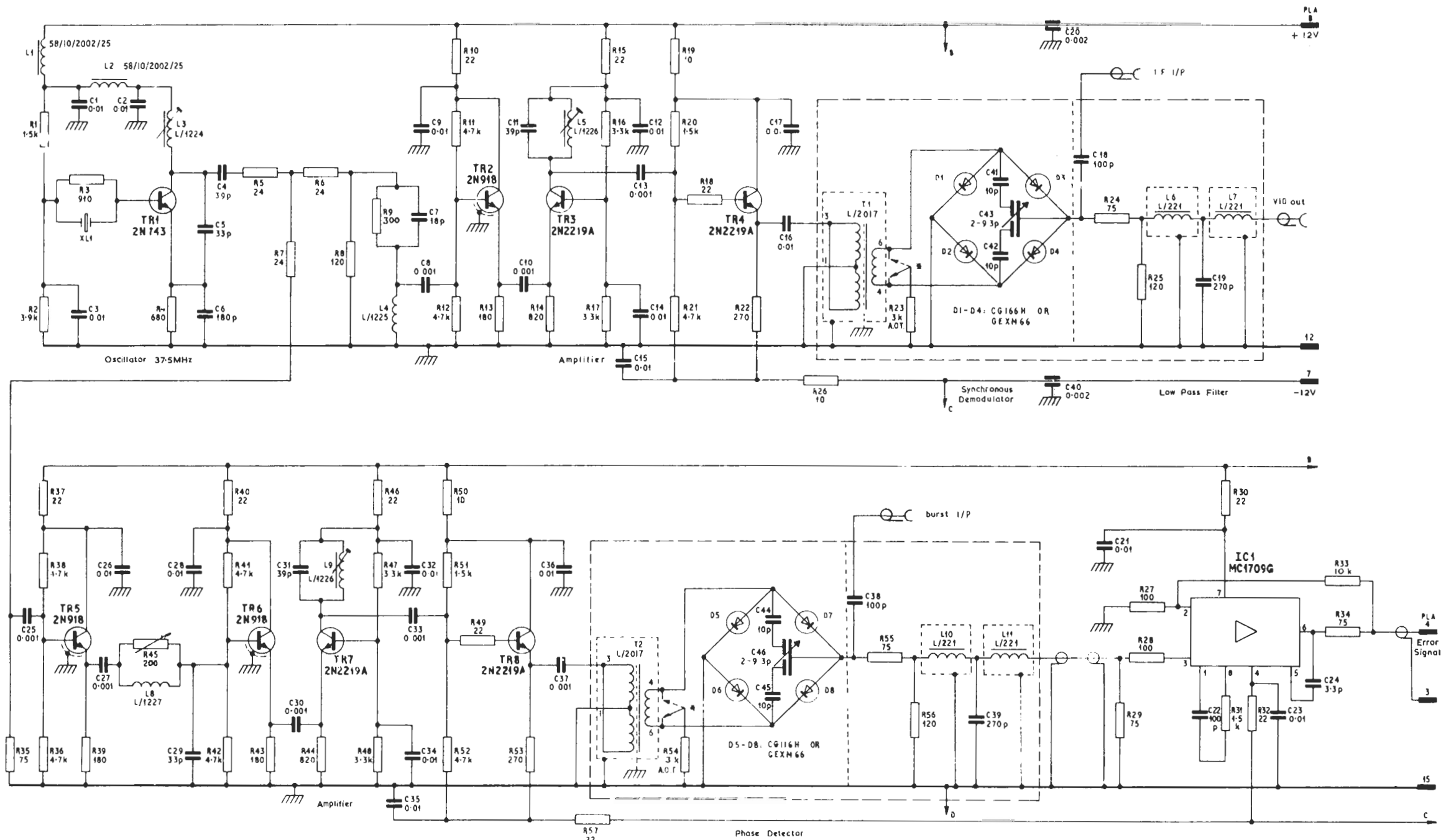
The unit is tested in conjunction with the parent receiver, but the following points can be noted

1. The d.c. potentials across C20 and C40 are 12 V \pm 100 mV and -12 V \pm 100 mV respectively.
2. A counter connected by a probe to the junction of C16 and T1 should indicate a frequency of 37.5 MHz \pm 10 Hz
3. At the junction of R7 and C25 the amplitude of the locally-generated 37.5 MHz should be approximately 1 V p-p.
4. With L5 tuned to resonance at 37.5 MHz, the amplitude of the local oscillator signal at the junction of C16 and T1 should not be less than 5.5 V p-p.
5. With L9 tuned to resonance at 37.5 MHz, the amplitude of the local-oscillator signal at the junction of C37 and T2 should not be less than 5 V p-p.
6. With an oscilloscope connected to the i.f. input socket, C43 is adjusted to give a minimum output (approximately 2 mV p-p). C46 is adjusted in the same way. (Note that a Tektronix 585 or similar oscilloscope and a filter to remove i.f. harmonics will be required.)
7. The value of R23 and R54 may be between 600 ohms and 6.8 kilohms and may be connected to either end of the secondary of T1 and T2, whichever gives the best balance.

Reference

1. Designs Department Specification No.6.155(70)

AIB 1/72



Note
■ Indicates alternative wiring points

from D26615 A2
parts list D26616 A4

DM2/506: Circuit Diagram