

SECTION 20

AMPLITUDE DEMODULATOR DM2/502

Introduction

This sub-unit accepts a 30-MHz amplitude-modulated double-sideband signal and retrieves from it the modulating information, which can be a composite video signal.

The sub-unit is constructed on a chassis type CH1/12A (indexing-pin positions: 14 and 9). The components are assembled on a printed-wiring board, which is enclosed by a screening cover.

General Specification*Input*

Peak-white
30-MHz signal 25 mV r.m.s. (nominal)

Output

Composite video signal 1 V p-p into 75-ohm load (adjustable)

Impedances

Input 75 ohms
Output 75 ohms

Equivalent Video Frequency Response ± 0.3 dB from d.c. to 5 MHz

Linearity

Picture-signal
Distortion factor less than 1% (sync/peak-white amplitude ratio 9%)

Pulse-and-bar 'k' Rating

1T pulse, 625-line
Less than 2% for both shape and pulse-to-bar ratio

Gain Variations (approximate)

With temperature -0.01 dB/ $^{\circ}$ C
With supply voltage $+0.1$ dB/V (+18-volt supply)
Negligible (-12 -volt supply)

Overall Delay 70 ns

Weight $1\frac{3}{4}$ lb.

Power Requirements +18 volts, 160 mA
 -12 volts, 45 mA

Circuit Description

The circuit of the sub-unit is shown in Fig. 20.1. Two cascode-connected amplifying stages TR1, TR2 and TR3, TR4 are coupled by a type of band-pass circuit which is described under AM2/501 in Instruction V.7. The output signal from the second of these stages is full-wave-rectified to produce the required video signal from which carrier and carrier-harmonic frequencies are removed by the succeeding chain of equaliser sections. These complex filters provide a constant-resistance load for the rectifying diodes, in order to obtain optimum differential-phase response when the signal contains colour information.

The signal from the equaliser has, typically, an amplitude of 0.5 V p-p and is amplified to give an output signal of 1 V p-p into 75 ohms from a source impedance of 75 ohms; this represents a gain of approximately 10 dB from the base of TR5. TR5, TR6 and TR7 are an emitter-follower and two common-base amplifiers in cascade, followed by two further emitter followers TR8 and TR9 to reduce the impedance of the circuit path to a low value which, in series with R41, gives the required 75-ohm source impedance. There is negative feedback from the emitter of TR9 to the base of TR6. D.C. conditions throughout these direct-coupled stages are adjustable by means of RV2, which is a pre-set control mounted inside the sub-unit, on the printed-wiring board; the control is set to produce zero standing potential at the output of the sub-unit connector.

Maintenance

If any of the transistors TR1 to TR4 is renewed, realignment of the tuning of the carrier-frequency circuits may be necessary. The procedure is set out in Designs Department Specification No. 7.65 (65).

If any of the transistors TR5 to TR9 is renewed, RV2 should be adjusted, with no R.F. input to the sub-unit, to bring the potential of the output pin 6 of the connector to zero.

The following are typical transistor-electrode voltages, measured with no R.F. input to the sub-unit, using the lowest usable range of an Avo

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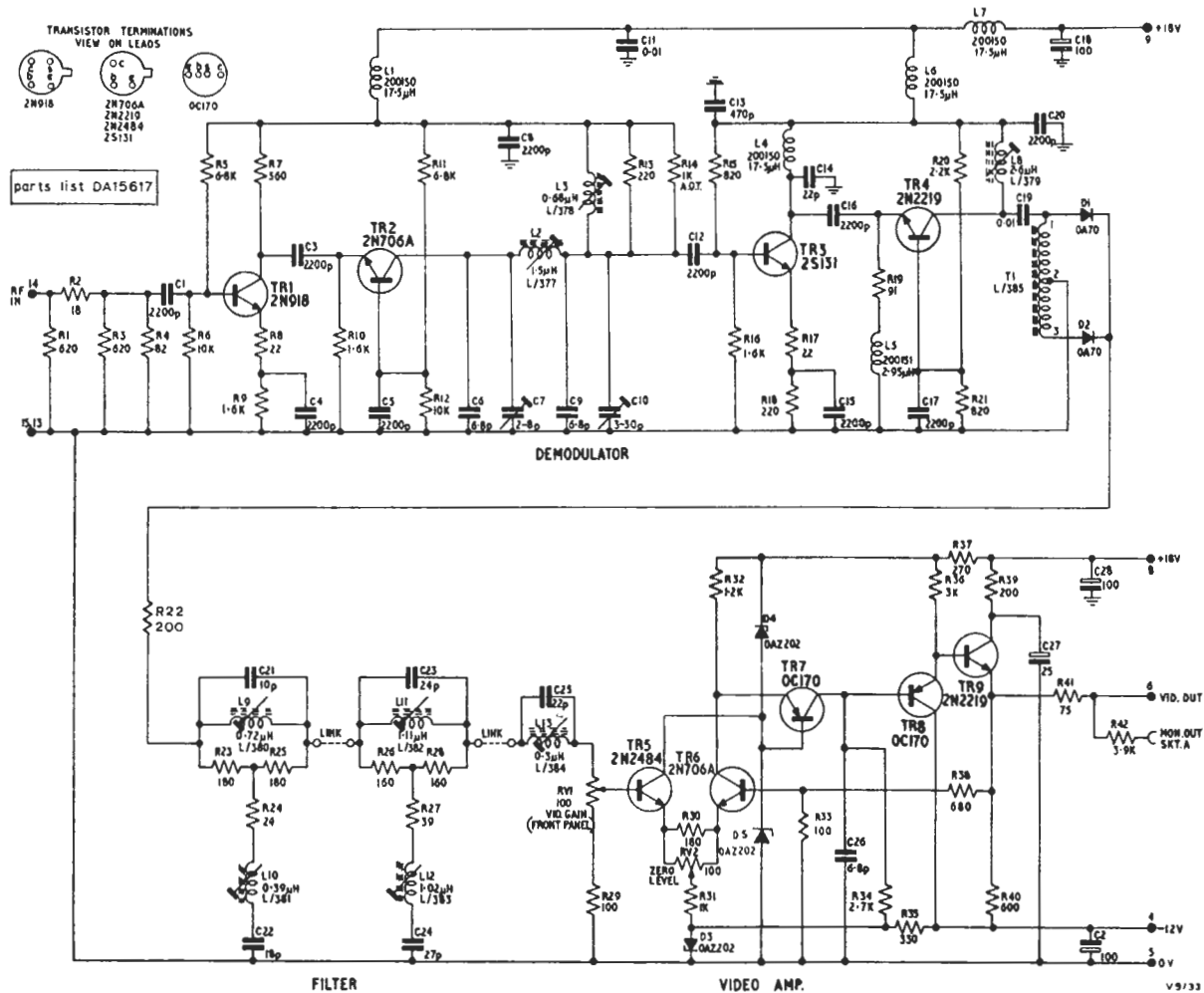


Fig. 20.1 Circuit of the DM2/502

Model-8 test meter:

Transistor	Emitter	Collector
TR1	+8.6 V	+14 V
TR2	+8.9 V	+17 V
TR3	+9.6 V	+16 V
TR4	+3.8 V	+16.3 V
TR5	-0.6 V	+6 V
TR6	-0.7 V	+6.4 V
TR7	+6.4 V	+0.3 V
TR8	+0.5 V	-12 V
TR9	0 V	+14 V

Reference

In addition to the Designs Department Specification mentioned above, Designs Department Technical Memorandum No. 7.109(65) refers to this sub-unit.

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