VIDEO CRISPENER AM19/509

Introduction

The AM19/509 is a non-linear amplifier which increases the subjective crispness of a 625-line video signal which has been bandwidth limited to about 3 MHz. The signal to noise ratio is not significantly altered by the crispening action. The input signal can be composite or non-composite.

The unit is built on to a CH1/12A chassis with index-peg positions 18 and 43.

General Specification

Voltage Gain	6 dB (adjustable ±0·8 dB)
Inputs	
Non-composite video	0·35 V p-p
Composite Video	0·5 V p-p
Blanking (negative going)	2 V p-p
Outputs	
Non-composite video	0·7 V p-p ±0·8 dB
Composite video	1·0 V p-p ±0·8 dB
Input Impedance	
Video	75 ohms
Blanking	1,000 ohms
Output Impedance	75 ohms
Overload Point	2·8 V p-p sine wave input
Frequency Response up to 3 MHz (with crispening control set to zero)	Flat to within 0·2 dB
Power Requirements	40 mA at 210-260 volts, 50 Hz
Operating Temperature Range	10 °C to 55 °C
Weight	2 lb

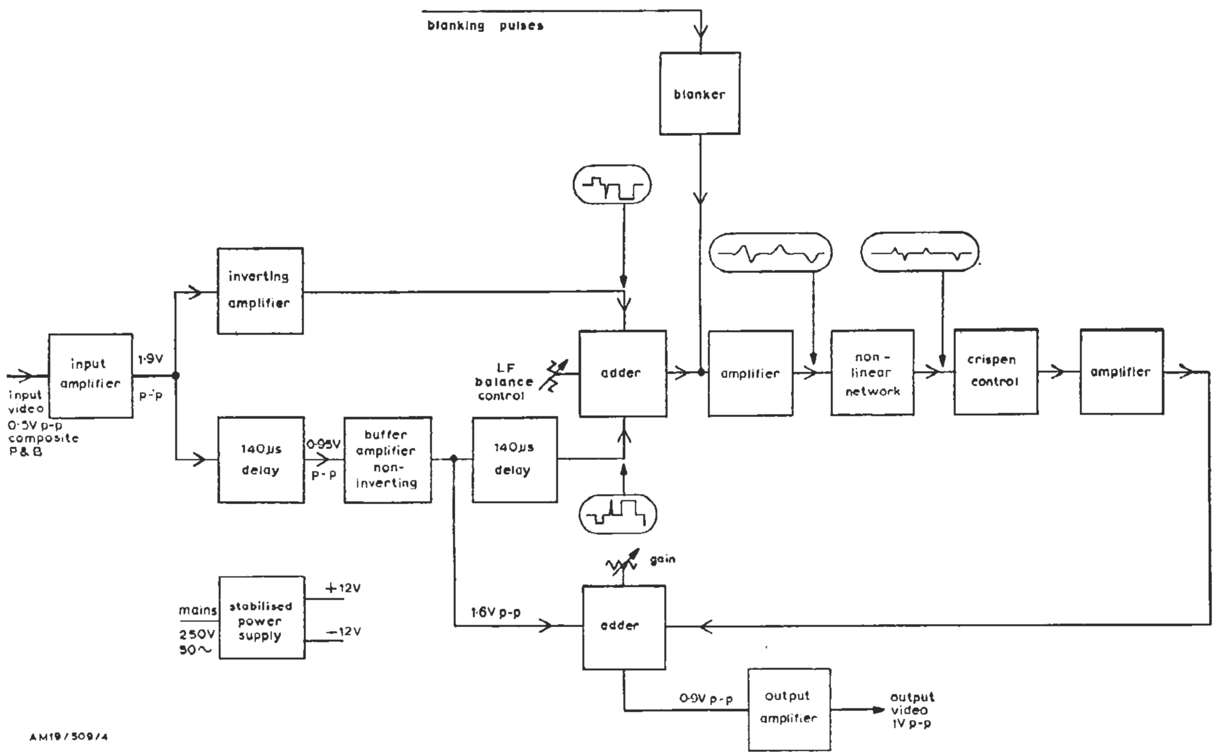


Fig. 1 Block Diagram of the Video Crispener AM19/509

General Description

A block diagram is given in Fig. 1. The input signal, after amplification, is fed to two paths having equal gain. One path inverts the signal; the other path is non-inverting and includes two h.f. delay networks. The signals from the two paths are added across a balance control and the difference signal, consisting of the h.f. components, is shaped by a non-linear network and added to the original signal.

Circuit Description

The circuit is given in Fig. 2 and the effect of the crispening action on a pulse-and-bar signal, bandwidth limited to 3 MHz, is shown in Fig. 3.

The input signal is amplified but not inverted by the feedback pair TR7/TR8. From the collector of TR8 the signal passes via the inverting amplifier TR9/TR10/TR11 to one end of the l.f. balance control R34 and, in parallel, via the non-inverting buffer amplifier TR18/TR19 and two 140 ns delay networks to the other end of the balance control. The gains of the two paths are equal.

R34 is adjusted so that the l.f. components balance and the delayed h.f. components only appear at the slider. A monitoring point is provided to facilitate the balance adjustment. The h.f. components are next amplified and then passed through the non-linear network R46/C20/D7 and R47/C21/D8 which modifies the signal leaving the positive-going and negative-going peaks as shown in Fig. 4. The processed signal is amplified by TR16/TR17 and is then applied to one end of the gain control R66. The other end of R66 is connected via R63 to the collector of TR19. Hence the output amplifier TR20/TR21 has the original signal, delayed by 140 ns, and the processed h.f. components applied to its input base.

The gain control, which allows only a small variation of gain, also slightly alters the amount of crispening. Thus the gain control is set first to give the specified gain with the crispening control set to zero. The crispening control is then adjusted to give the required degree of crispening.

If the input signal is composite, the crispening action is inhibited during the blanking periods so that the sync pulses pass through unmodified. This is achieved by the action of TR12 which is pulsed into the conducting state by negative-going blanking pulses; this effectively shortcircuits the crispening signal at the slider of the balance control.

The stabilised power supply circuit follows standard practice and gives two outputs, +12 V and −12 V, which are set by R10 and R13.

Maintenance

Routine maintenance is not required, but the checks below may be made if the performance becomes suspect.

1. With an Avometer Model 8, check the positive and negative supply rails and adjust as necessary.
2. With the Avometer connected across the unterminated output (i.e., from terminal 8 to ground) the standing d.c. potential should be less than 0·2 volt. This is set by adjustment of R20, nominally 68 kilohms.
3. With a 10-KHz sine-wave input of 1 V p-p, adjust R34 to give a minimum reading on an oscilloscope connected to the monitor point.
4. Using the changeover technique and with the crispening control set fully anticlockwise, set the gain by adjustment of R66 to be exactly 6 dB. If this cannot be achieved check the gain of the feedback pairs TR7/8, TR18/19 and TR20/21. Typical video levels are shown on the circuit diagram in Fig. 2.
5. With a 10-KHz sine-wave input of 2·8 V p-p check, with a terminated oscilloscope connected to the output, that limiting is not occurring. Remove the input and check that any hum on the output is less than 5 mV p-p.
6. With any convenient composite video signal connected to the input, and with an oscilloscope connected to the monitor point, check the setting of the l.f. balance control. The displayed waveform should not contain l.f. components.

AIB 8/69

See page 5 for Fig. 3

See page 6 for Fig. 4

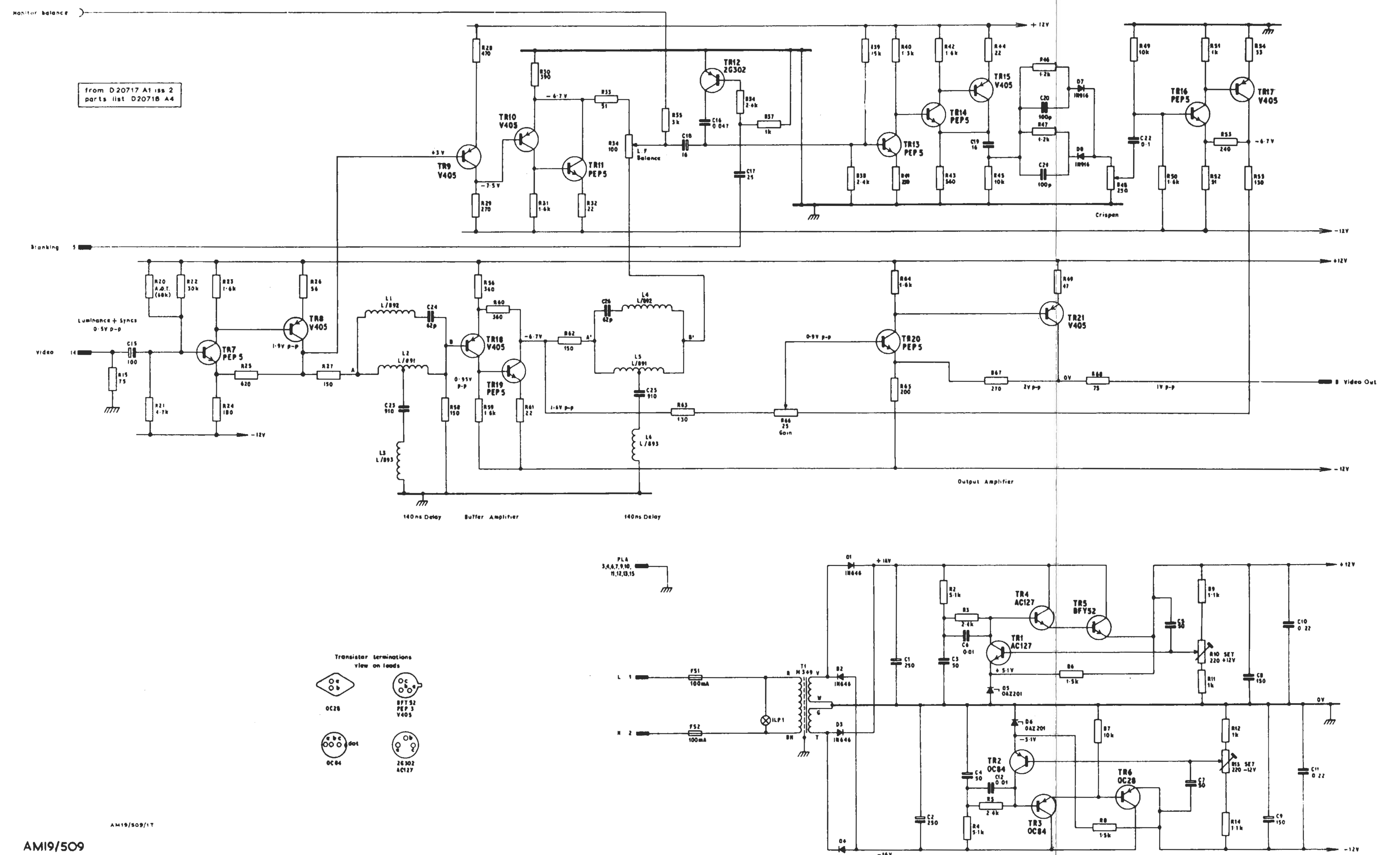


Fig 2 Ciruit of Video Crispener AM19/509

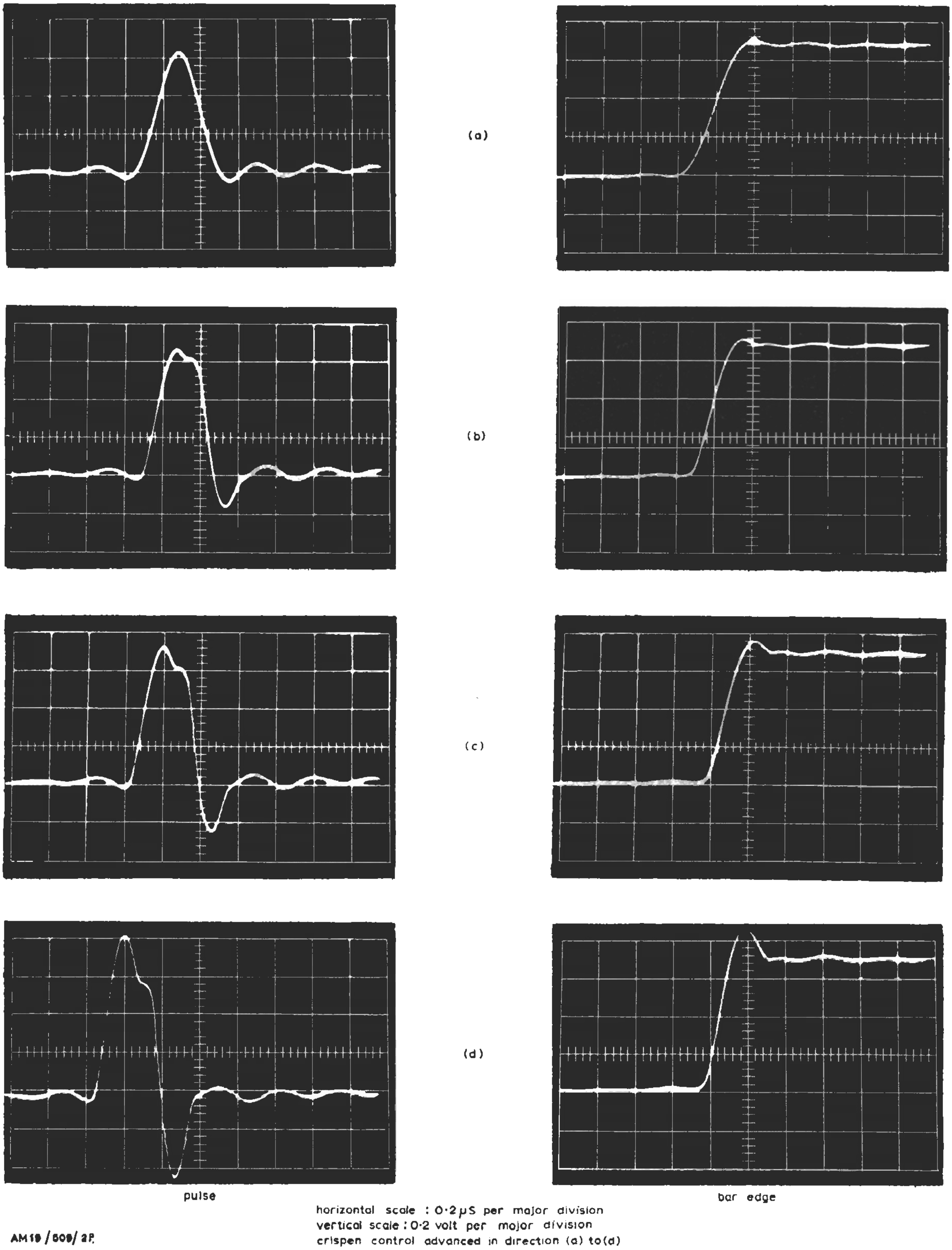
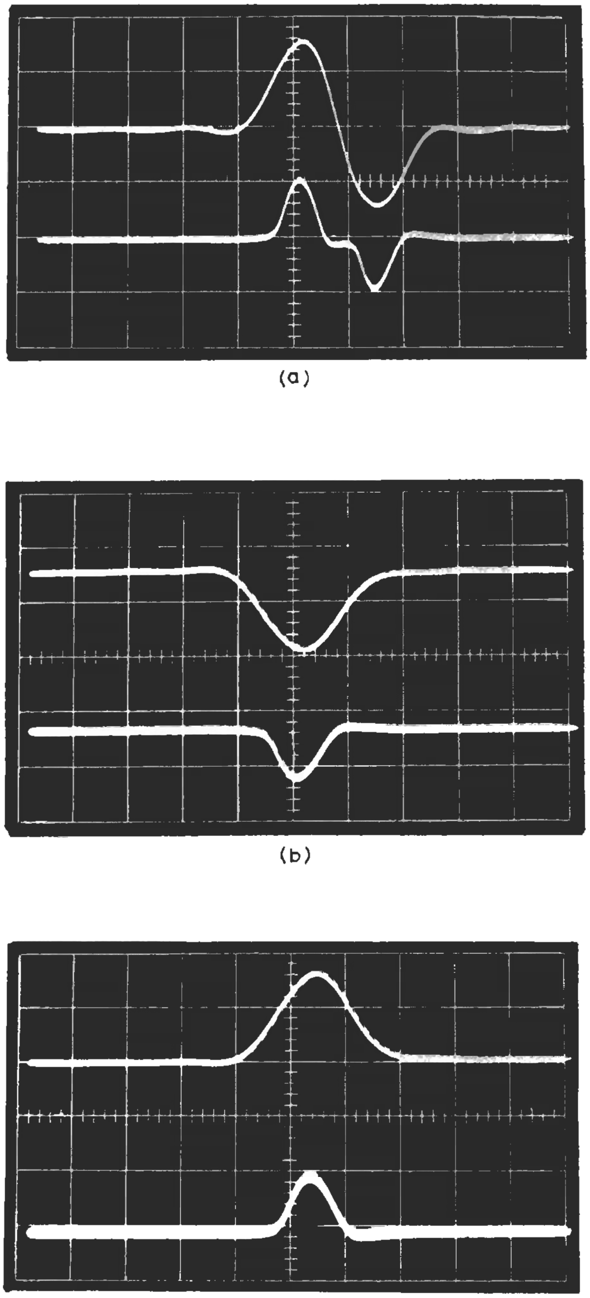


Fig. 3 Effect of Crispen Control on Pulse and Bar Signal



AM19/509/3P

Fig. 4 Effect of Non-linear Network on 2T 625-line Pulse and Bar Signal Band-limited to 3 MHz

top trace collector of TR15, 0·5 V/cm
lower trace top end of R48, 0·1 V/cm
(a) pulse (b) bar end (c) bar start