RUGGEDISED SOUND-IN-SYNCS DECODER CD3/515

CONTENTS

INTRODUCTION

The CD3/515 accepts a Ruggedised Sound-in-Syncs input signal and produces separate outputs of audio and composite video.

The decoder consists of plug-in sub-units mounted within a portable carrying case. With the exception of the power supplier, which is mounted on a four-inch wide aluminium sub-chassis, each of the sub-units is constructed on a single printed-wiring card with 33-way ISEP edge-connector. The edge-connector index-peg positions are given in the individual Instructions for each unit.

GENERAL SPECIFICATION

Input

Combined Signal	1 Vp-p into 75 ohms

Outputs

Video	1 Vp-p into 75 ohms
Audio	0 dB into 600 ohms

Performance

(Where applicable figures refer to back to back connection with Coder CD2/508.)

1-kHz Harmonic Distortion	less than -54 dB
Audio Signal to Noise Ratio CD2/508 selected to	estimated by subjective comparison
(a) 0 dB	better than 54 dB peak signal/peak weighted noise
(b) -70 dB MIC AMP GAIN at MAX	better than 40 dB peak signal/peak weighted noise
Pulse k-rating	2%
Bar k-rating	2%
50 Hz Square Wave	1%
Differential Phase 0 dB	1°
3 dB	2°
Differential Gain 0 dB	0·5%
3 dB	1%
Chrominance/Luminance Gain Inequality	5%
Peak Picture/ r.m.s. noise	better than 55 dB (10 kHz to 5·5 MHz)

Dimensions

Width	500 mm (19½ in)
Height	216 mm (8½ in)
Depth	318 (12½ in)
Weight	13·8 kg (30·5 lbs)

OPERATIONAL FACILITIES

MUTE *Switch*

In the **ON** position the sound muting amplifier mutes the audio output while a fault condition is present. The **OFF** position overrides the muting action.

ERROR INDICATOR

This lamp indicates fault conditions irrespective of position of **MUTE** switch.

SYNC *Switch*

The **HARD** position is selected unless input signal noise makes operating in this position unreliable. The **FLYWHEEL** position, which has a slight timing drift (about 100 ns), is selected when the input signal noise is high.

Note that in the **HARD** position standard video can be passed through the decoder.

QUICK CHECKS

Note: An R.S.I.S. input signal for this unit can be provided by Coder CD2/508.

(1) Connect a standard level R.S.I.S. signal to the **COMBINED SIGNAL IN** input and check that the **FLYWHEEL LOCK** lamp is on and the **ERROR INDICATOR** lamp is off.
(2) Disconnect the **COMBINED SIGNAL IN** input and check that the **ERROR INDICATOR** lamp comes on and the **FLYWHEEL LOCK** lamp goes out.

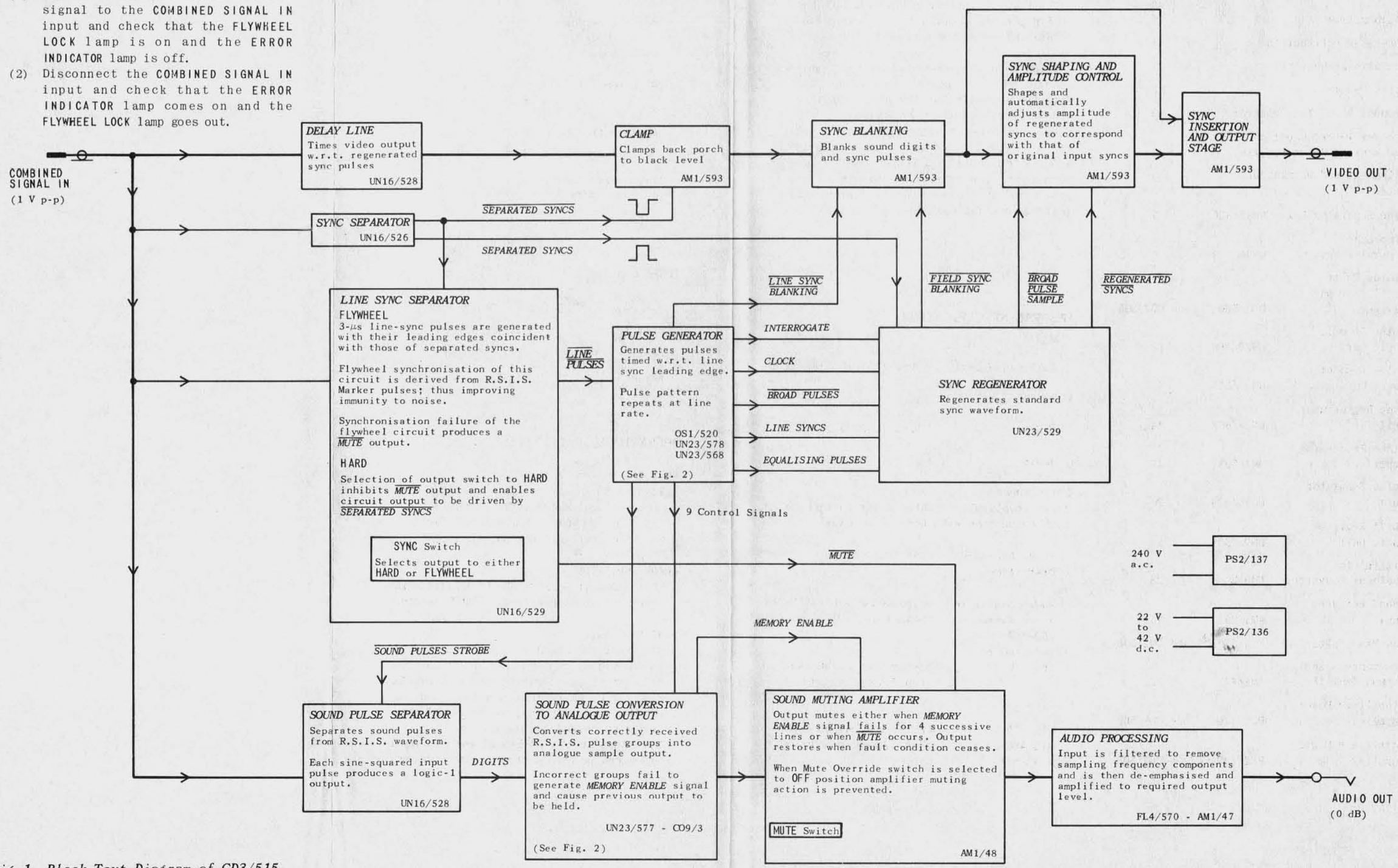


Fig.1 Block-Text Diagram of CD3/515

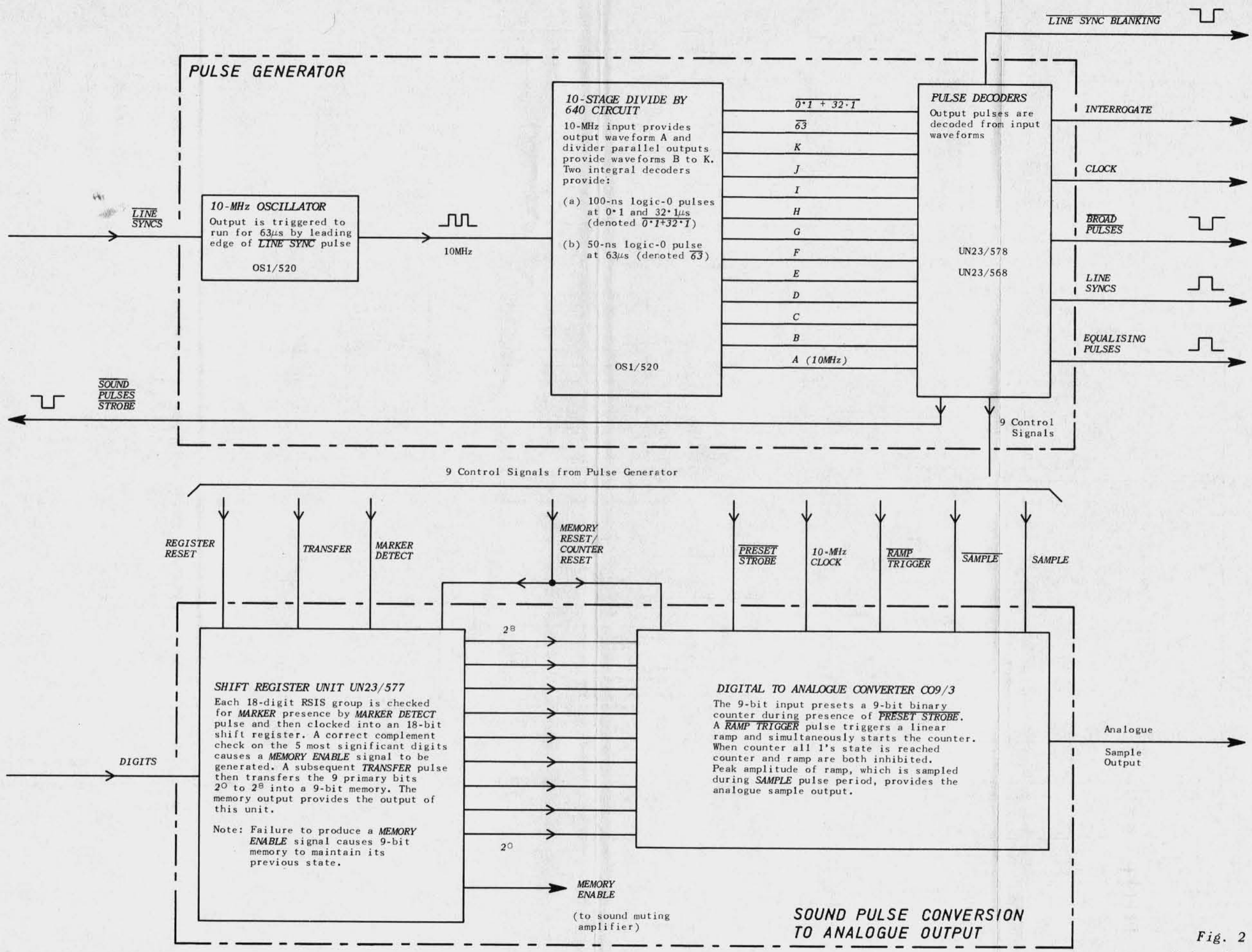
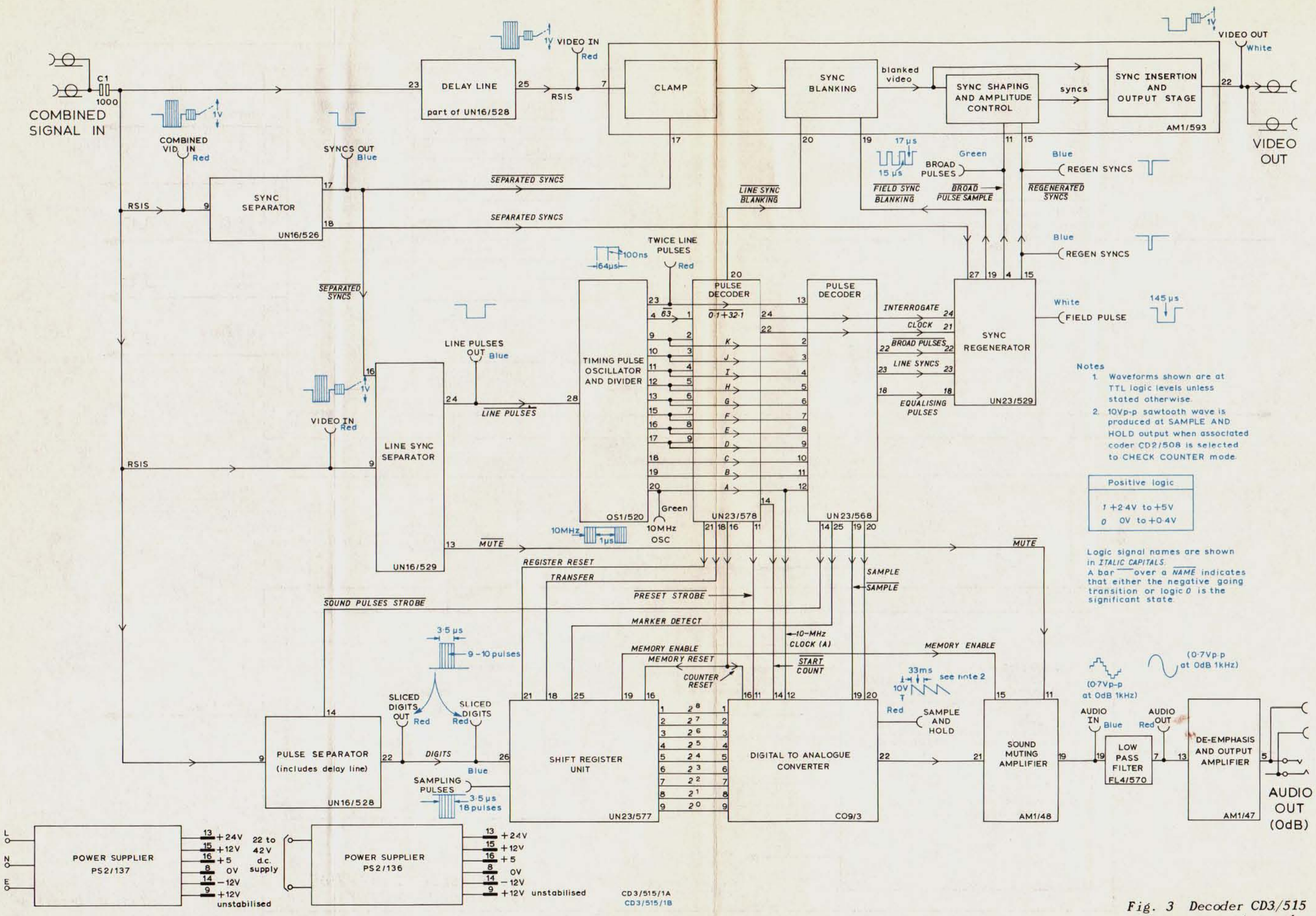


Fig. 2 Detail of Pulse Generation and Sound Pulse Conversion to Analogue Output



Notes

1. Waveforms shown are at TTL logic levels unless stated otherwise.
2. 10Vp-p sawtooth wave is produced at SAMPLE AND HOLD output when associated coder CD2/508 is selected to CHECK COUNTER mode.

Positive logic	
1	+2·4V to +5V
0	0V to +0·4V

Logic signal names are shown in *ITALIC CAPITALS*.
A bar ‾ over a *NAME* indicates that either the negative going transition or logic *0* is the significant state.

Fig. 3 Decoder CD3/515 Interconnection and Monitor Point Diagram

MAINTENANCE AND ALIGNMENT

General

Monitoring Points

Fig. 3 is an interconnection diagram showing the rear panel interconnections and front of unit monitoring points. Waveforms indicated at these points are typical.

Back Wiring Component

C1 is a 1000-μF reversible electrolytic capacitor which a.c. couples the **COMBINED SIGNAL IN** to the decoder circuit.

Pulse Timing Reference

The 0-μs reference for all pulse timing is the leading edge of line-syncs at the input of the Timing Pulse Oscillator and Divider OS1/520. Access to this pulse for external triggering of an oscilloscope is provided by the **LINE PULSES OUT** (blue) monitoring point of the UN16/529.

Use of Extender Board

An extender board is housed inside the parent equipment back cover. Any unit can be extended without affecting the operation of either the extended unit or the parent equipment.

External Connections

(1)	**COMBINED SIGNAL IN**	1-V p-p R.S.I.S.
(2)	**VIDEO OUT**	75-ohm load
(3)	**AUDIO OUT**	600-ohm load

Overall Alignment

Sync Separator UN16/526

This unit is set up in production and should not require subsequent adjustment.

Line Sync Separator UN16/529

1. Connect an R.S.I.S. signal to the **COMBINED SIGNAL IN** input.
2. Externally trigger an oscilloscope from the **SYNCS OUT** (blue) monitor point of the UN16/526. Observe the leading-edge timing of the output pulses at the **LINE PULSES OUT** (blue) monitor point first with the **SYNC** switch in the **HARD** position and then with the **SYNC** switch in the **FLYWHEEL** position. If the leading-edge timing is not within 20 ns of coincidence adjustment is necessary as follows:
3. Disconnect the R.S.I.S. input signal and check that the free-running frequency of the blocking oscillator circuit (TR9) is about that of line frequency. If necessary adjust R57.
4. Reconnect the R.S.I.S. input signal and adjust R39 until the leading edges observed in step 2 are coincident. Note that this adjustment must be accurate and consequently a time-base speed of say 200-ns/div. is necessary.

Timing Pulse Oscillator and Divider OS1/520

Details of this unit are given in the Coder CD2/508 Instruction.

Pulse Decoder UN23/578

All input and output waveforms are included in the OS1/520 and UN23/578 block-text diagrams.

Pulse Decoder UN23/568

All input and output waveforms are included in the OS1/520 and UN23/568 block-text diagrams.

Sync Regenerator Unit UN23/529

All input and output waveforms are included in the UN23/568, UN23/578 and UN23/529 block-text diagrams.

Video Processing Amplifier AM1/593

1. Connect an R.S.I.S. signal to the **COMBINED SIGNAL IN** input and terminate **VIDEO OUT** in 75 ohms.
2. Check that the output signal with regenerated syncs has the same amplitude as the input signal and if necessary adjust R23.
3. Check that the output signal black level is at 0 volts. If adjustment is required, check that the back porch of TR4 emitter waveform is clamped to 0 volts and if necessary adjust R10. Re-check the output signal black level and if it is still incorrect adjust R95.

Notes on A.O.T. Components:
(The values of these components are selected in production and should not normally require adjustment.)

R68 is selected so that the drive signal to switching transistor TR16 is just sufficient for TR16 to saturate. In some instances R68 can be omitted (i.e. open circuit).

R84/R85 form an attenuator with an input resistance of about 540 ohms. The value of attenuation is selected so that the signal passed to gate 2 of TR21 produces a source output of about 0·6 volts p-p when the sync-amplitude control-voltage to gate 1 is about +1 volt w.r.t. chassis.

R72 This is selected so that a 70:30 picture:sync ratio is produced at the output of the unit when a 70:30 picture:sync ratio input signal is present at the **COMBINED SIGNAL IN** input.

Pulse Separator Unit UN16/528

The pulse separating circuit is set up in production and should not require subsequent adjustment.

Delay Line Alignment Procedure

Observe the video output from the R.S.I.S. parent unit and check the time relationship between video and re-inserted syncs during the line-sync interval. If the timing is not as shown in Technical Instruction P.8 advance or delay the vision signal with respect to line sync by altering the number of delay line sections in circuit.

Shift Register Logic Unit UN23/577

(1) Connect an R.S.I.S. signal to the **COMBINED SIGNAL IN** input and observe the $\overline{CLOCK}$ burst at the **SAMPLING PULSES** (blue) monitor point.
(2) Check that the $\overline{CLOCK}$ p.r.f. is 5 MHz and if necessary adjust C7.

Digital to Analogue Converter CO9/3

(1) Connect the output of R.S.I.S. Coder CD2/508 to the **COMBINED SIGNAL IN** input and select the Coder **A.D.C./CHECK COUNTER** switch to the **CHECK COUNTER** position.
(2) Examine the 30-Hz sawtooth at the **SAMPLE AND HOLD** (red) monitor point and check that the peak-to-peak amplitude is 10 volts. If necessary adjust a.o.t. capacitor C7.

Sound Muting Amplifier AM1/48

(1) Disconnect the input signal and select the **MUTE** switch to the **ON** position.
(2) Check that the drain-source voltage of TR2 is zero and if necessary adjust R31.

Low Pass Filter FL4/570

This unit is set up in production and should not require subsequent adjustment.

De-emphasis and Output Amplifier AM1/47

This unit is set up in production and should not require subsequent adjustment.