TAPE REPRODUCING AMPLIFIER AM16/9

Introduction

The AM16/9 accepts an a.f. signal from one of a pair of stereo tape replay heads and has a balanced input impedance of about 5 kilohms. The incoming level varies by about 40 dB over the audio band; the output is maintained constant at about zero level for tape speeds of 15 and 7½ inches per second by an overall response which corresponds basically to the appropriate 35 or 70-μs recording characteristic, but includes variable h.f. boost with pre-set adjustment. The required response is determined by circuits selected by relays.

The AM16/9 was designed for use in the RD4/4 Stereo Magnetic Recorder. It requires a d.c. supply of −24 volts and a separate 24-volt feed to operate the response-changing relays.

Mechanical Details

The unit is constructed on a standard ISEP printed wiring board having a 25-way edge connector with coding pin positions of 3, 9 and 19, which plugs into san ISEP nest. The pre-set gain and h.f. boost controls are of the multi-turn type mounted on the front edge of the board for easy access.

General Specification

Gain at 1 kHz	34 ±1 dB
Input Impedance	About 5 kilohms.
Output Impedance	About 4 ohms.
Frequency Response	Figs. 1 and 2 show the responses for tape speeds of 15 and 7½ in/s and for limit settings of R16 and R17. (See Fig. 3.)
Harmonic Distortion† Test frequency 1 kHz with all controls at max.	Output +4 dB at PLA25/10: total distortion ⩾ 0.5%, 2nd harmonic ⩾ 0.5%, 3rd harmonic ⩾ 0.2%.
Overload Point	Clipping starts when output at PLA25/10 exceeds +5 dB.
Noise All controls at max. Replay head connected to input. T.P.M. peaking 6.	< −80 dB.
D.C. Supply	−24 volts 12 mA.

Circuit Description

Fig. 3 shows the circuit of the AM16/9 with notes on essential functions.

Maintenance

D.C. Conditions

Test apparatus: Avometer Model 9.

The following voltages should be measured with respect to earth.

Circuit Point	*Measurement*
Junction R6/C2	−9 volts
TR1 emitter	−3.8 volts
TR2 emitter	−7.4 volts
TR3 emitter	−16.2 volts
TR4 emitter	−14.5 volts
TR5 emitter	−14.7 volts
TR6 emitter	−15.3 volts

A.C. Conditions

Details of a.c. tests on the AM16/9 are given in the Instruction for the parent equipment, e.g. the RD4/4.

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† In addition to the total harmonic figure used for general maintenance purposes (see Section 5.3.2 in the RD4/4 Instruction), limit values for the two main distortion components are specified here because:

(a) Distortion products generated as a result of the basic magnetic recording process are mainly third harmonics, whereas transistor-circuit distortion is often predominantly second harmonic. Consequently, a knowledge of individual harmonic distortion percentages in apparatus used with tape machines can be helpful in isolating a fault.

(b) If a transistor in an AM16/9 has to be changed, it may be necessary to measure the separated harmonic products so as to ensure that the replacement has parameters which suit the particular circuit. (Some transistor types exhibit a wide spread in the amount of second harmonic distortion produced by different examples.)

Obviously, a harmonic analyser is required to check individual distortion-component percentages. Since such instruments are not generally available, suspect units must be returned to the appropriate maintenance area for measurement and repair.

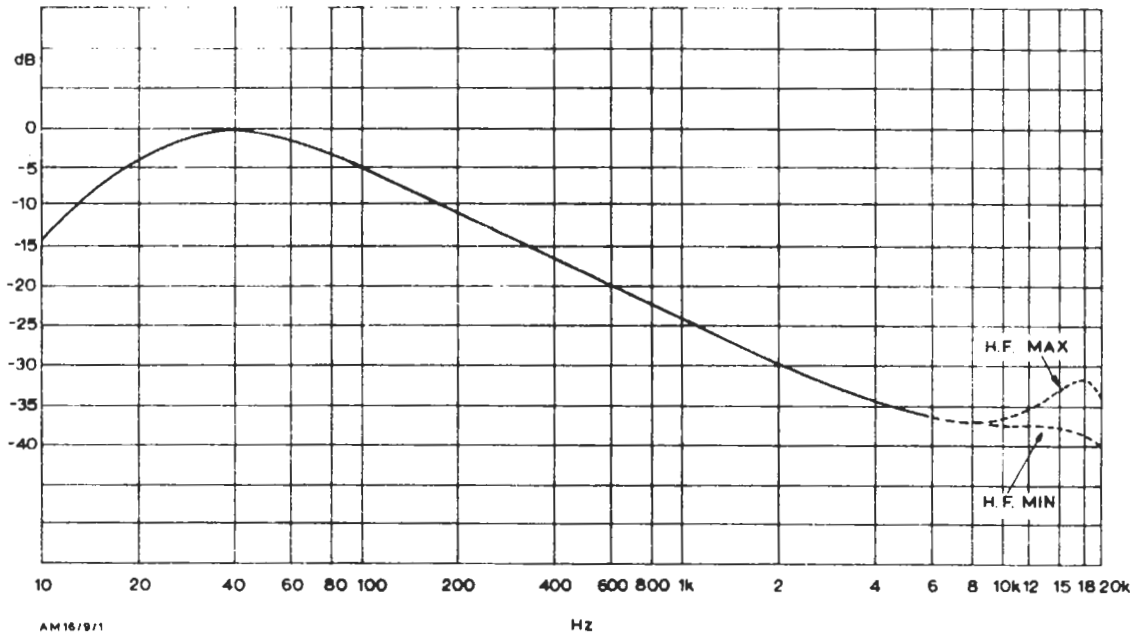


Fig. 1. 15-in/s Response of the AM16/9 for Limit Settings of H.F. Control

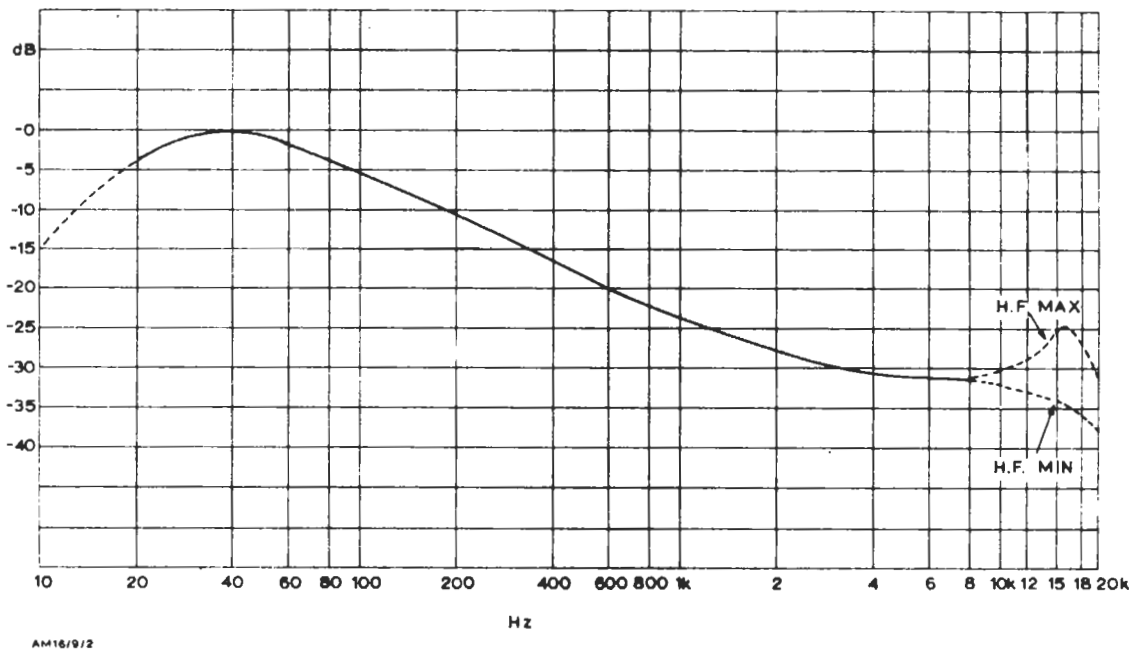
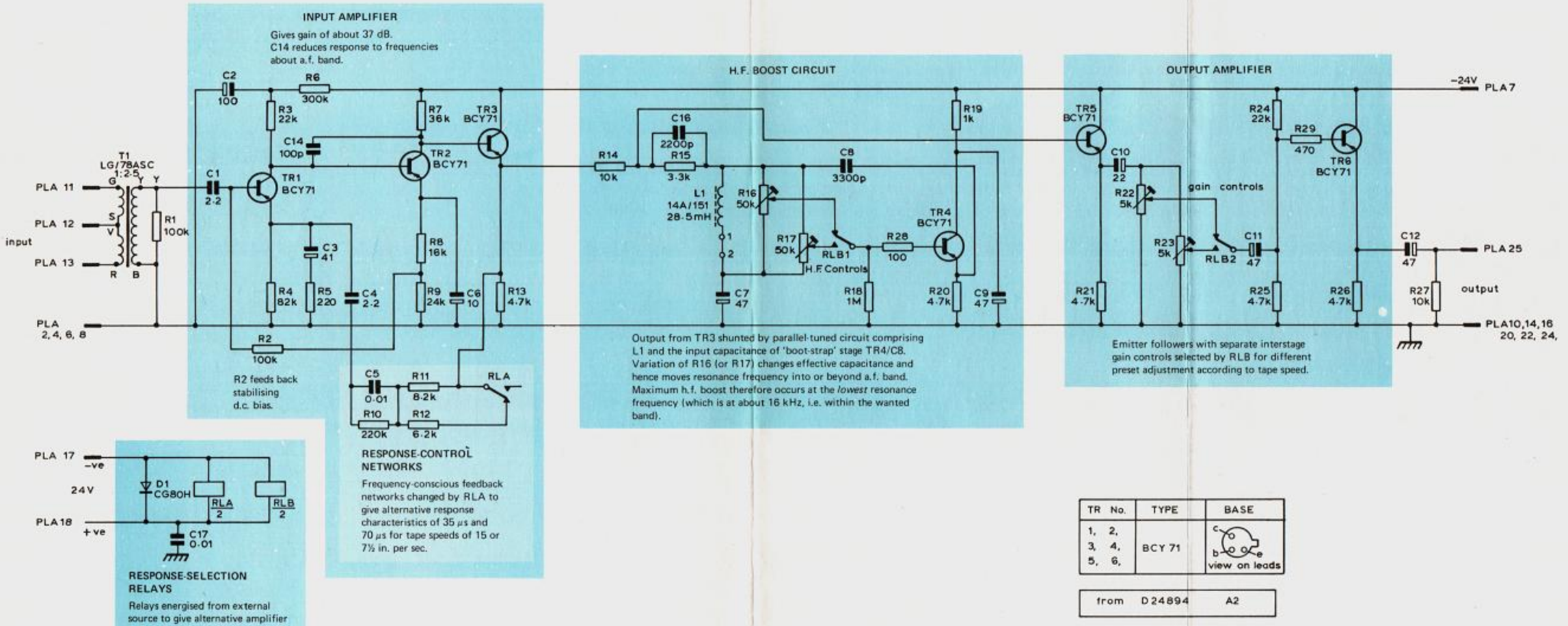


Fig. 2. 7½-in/s Response of the AM16/9 for Limit Settings of H.F. Control



TR No.	TYPE	BASE
1, 2, 3, 4, 5, 6,	BCY 71	c, b, e — view on leads

from	D24894	A2

Fig. 3. Circuit of AM16/9