issue 1
July 1979

CHANGES

TELEPHONE BALANCE UNIT – INTRODUCTION

INTRODUCTION

The UN1/173 and UN1/173A are identical units, except for the front panel. They are used in 'phone-in programmes to connect a P.O. line to an input of the programme presenter's clean feed and the output of the caller to the studio mixer.

Each unit is built on a non-standard D-sized chassis with index peg positions 50 and 70.

To maintain a natural separation between the presenter and the caller at the output of the studio mixer, the presenter's input signal must not appear at the output. This is achieved mainly by means of a voice-over circuit which attenuates the output when the input level exceeds a given threshold. The amount of attenuation and the threshold at which it occurs are variable over the ranges shown in Figs. 1 and 2. Note, that for reasonable separation, the voice-over level (amount of attenuation) must be set at not less than 6 dB.

Some additional separation is given by connecting the P.O. line via a partially balanced bridge. This circuit suffers in that it only provides a simply resistive balance control and within a programme, a variety of line impedances may be connected to the unit in quick succession.

A.G.C. is provided on the output signal. The circuit is also used to gate out low-level noise and cross-talk as demanded by P.O. regulations. The effect of a.g.c. and noise-gating is shown in Fig. 3.

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Illustrator *D.J. Morys*
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CONTENTS

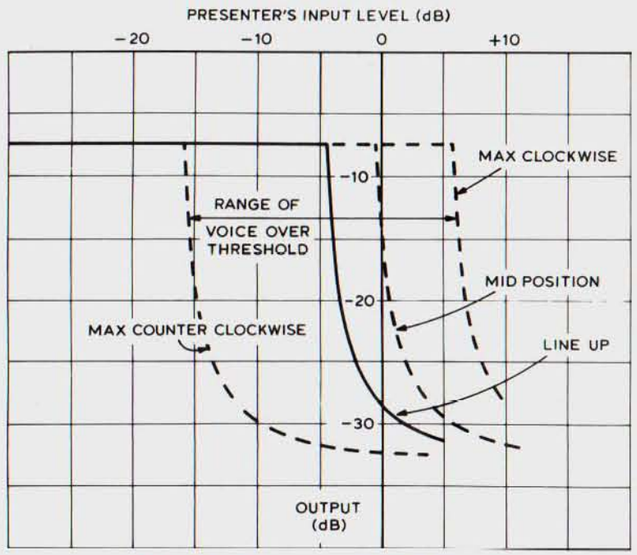


Fig. 1 Effect of voice-over threshold control

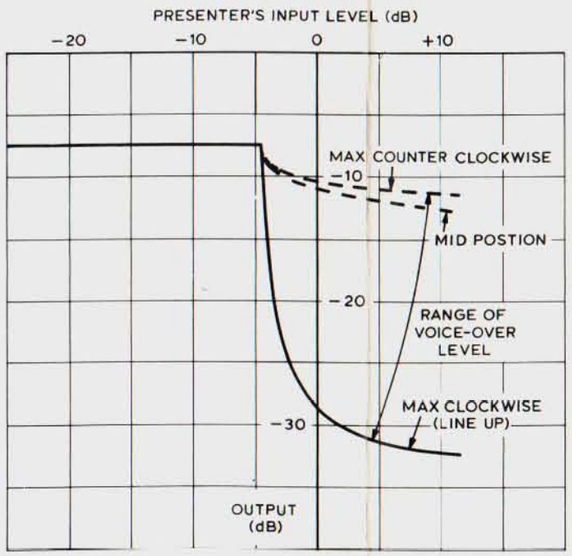


Fig. 2 Effect of voice-over level control

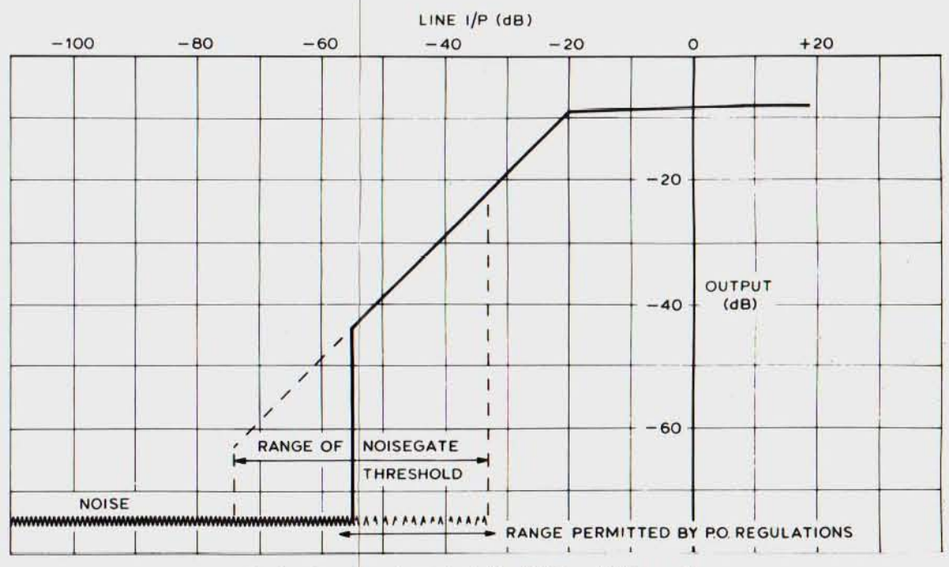
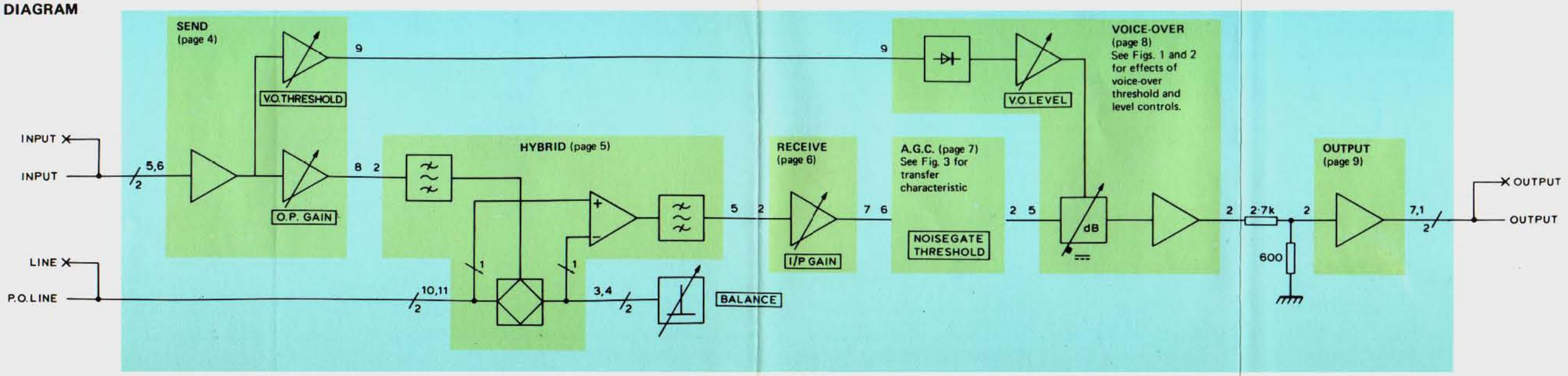


Fig. 3 Transfer characteristic of AGC and Noisegating

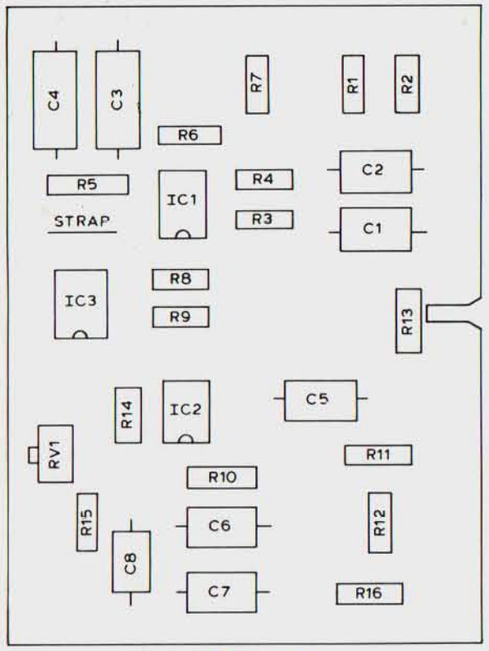
BLOCK DIAGRAM



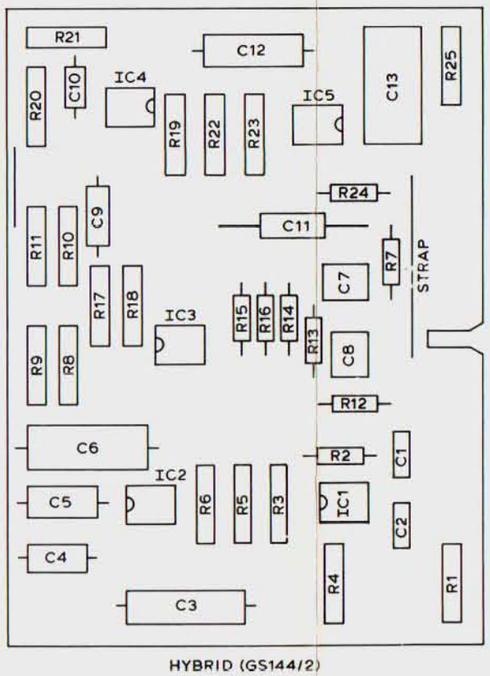
PHYSICAL LAYOUTS

CHANGES

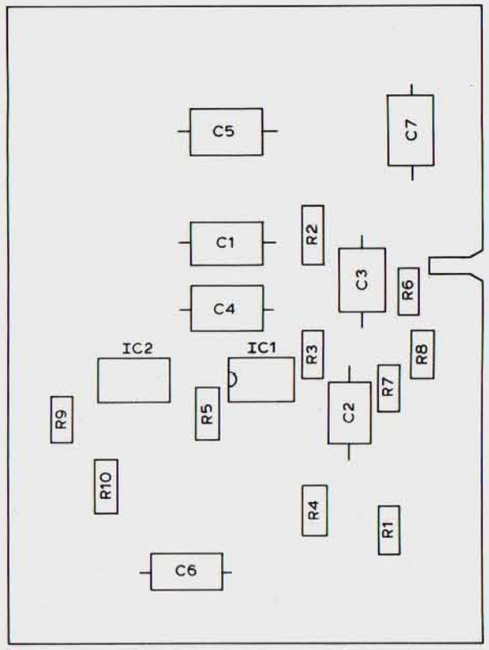
issue 1
July 1979



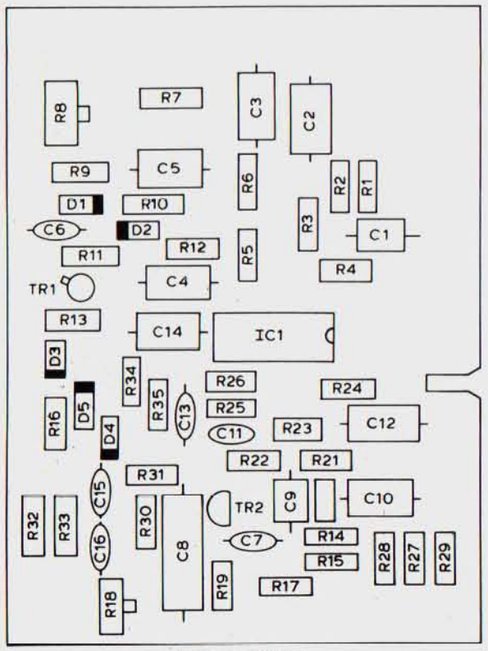
SEND (GS143/3)



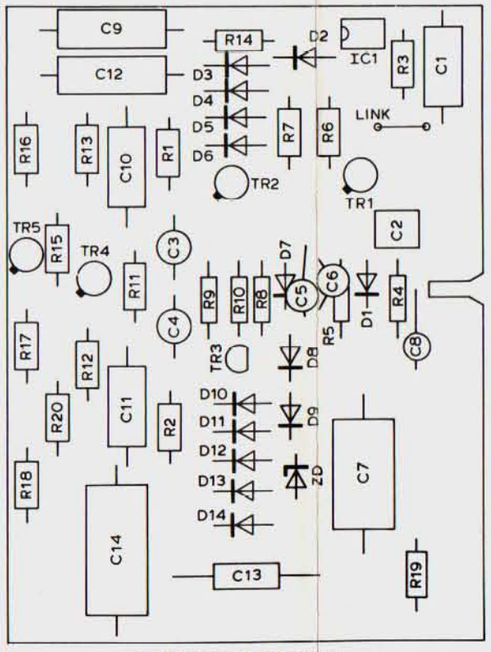
HYBRID (GS144/2)



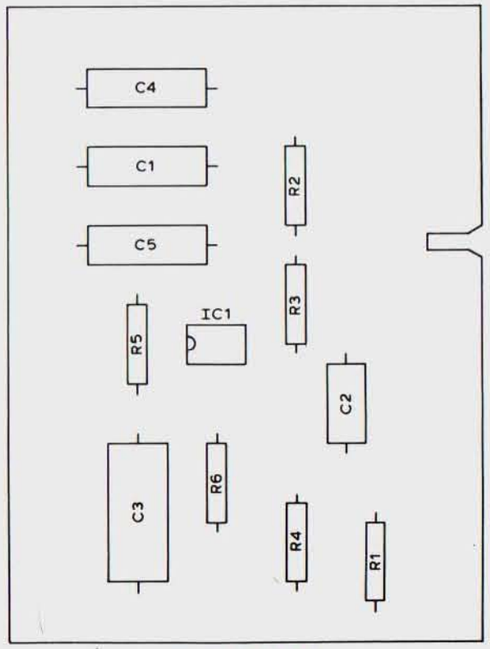
RECEIVE (GS145/2)



A.G.C. (GS295/3)

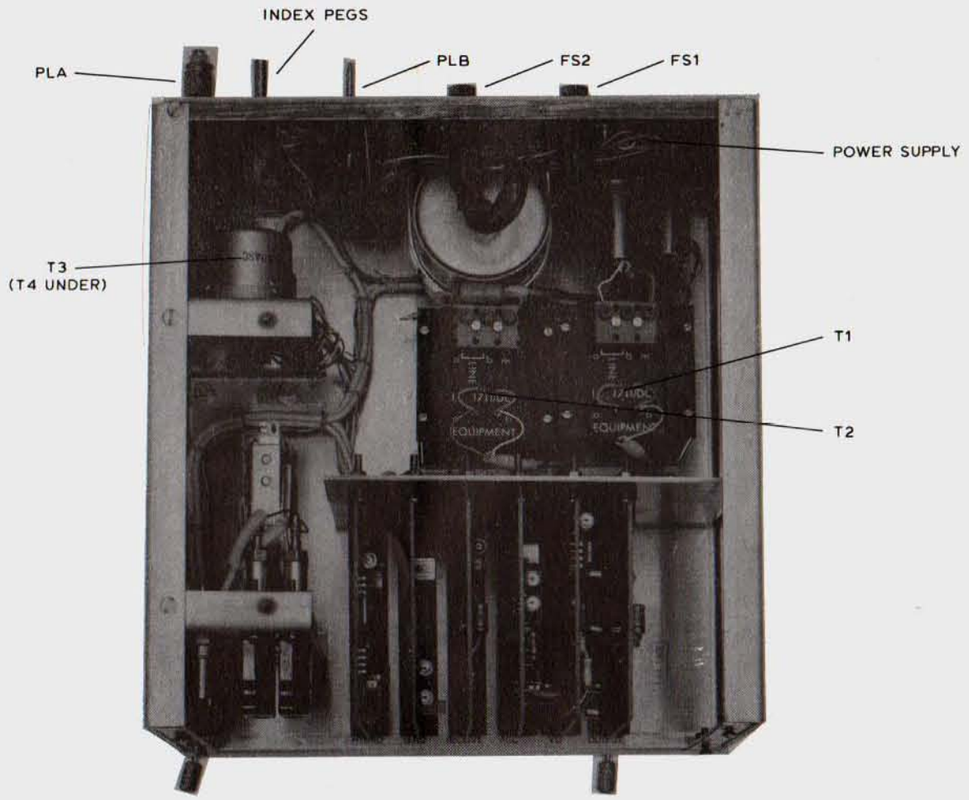


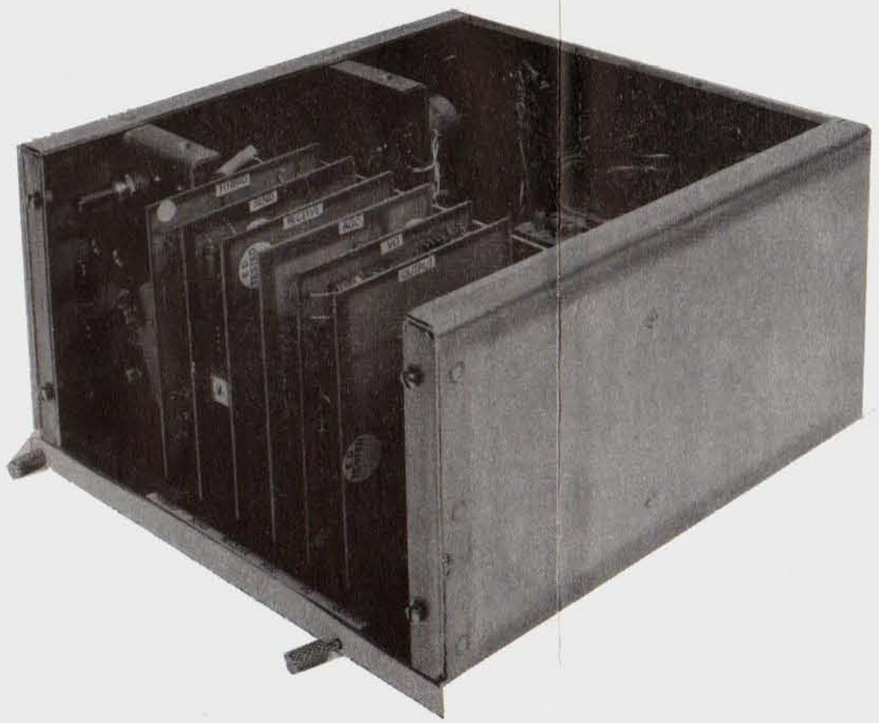
VOICE-OVER (GS147/2)

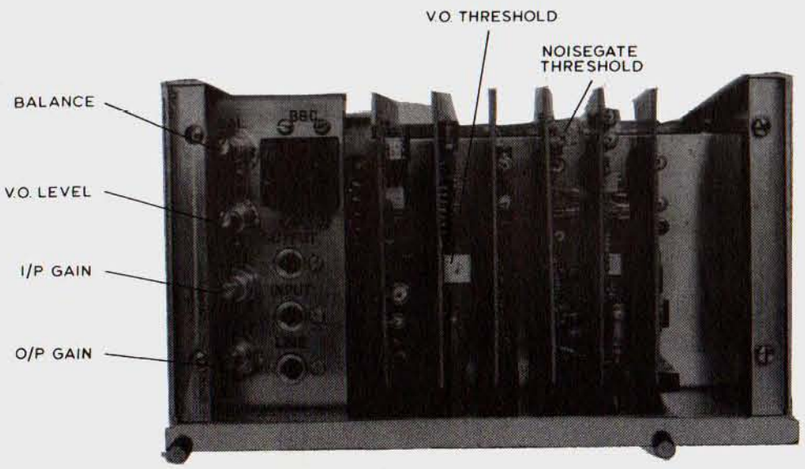


OUTPUT (GS158)

NOTE: A fourth digit in the board No e.g. GS 147/2, where it occurs signifies a modification. It affects performance, but not function.







ALIGNMENT PROCEDURE

1. Feed the *input* listen jack with 1-kHz tone at a level of 0 dB. Connect the 600-ohm input of a T.P.M. (e.g. EP14/1) to the *line* listen jack. Set *O/P GAIN* to give an output of −10 dB.
2. Set the tone source level to −30 dB, to avoid operation of the a.g.c. circuit. Connect a 600-ohm termination to the *line* listen jack. Connect the *output* listen jack to the high impedance input of the T.P.M.
   Set *BALANCE* to give minimum output on the T.P.M.
3. Connect the *line* listen jack to the tone source set to give an output of +4 dB. Set *I/P GAIN* to give maximum output without audible distortion. Alternatively the harmonic distortion may be checked using a high-pass filter (available on an EP14/1).
4. Connect a second tone source to the *input* listen jack set to give an output of +4 dB. Set the *V.O. LEVEL* to its maximum clockwise position. Set the *V.O. THRESHOLD* control on the Send amplifier to give the maximum output and note this level. Set the *V.O. THRESHOLD* to give a 4-dB drop in output. Increase the level at the *input* listen jack to 0 dB. The output level should now have dropped by a total of 16 dB to 18 dB. Set *V.O. LEVEL* for required drop to suit operational requirements. This drop should not be less than 6 dB.
5. Remove the tone source from the *input* listen jack. Set the level at the line listen jack to −50 dB. Set the *NOISEGATE THRESHOLD* on the A.G.C. board to just mute the output. (This level may be varied to suit operational requirements, but must not be set lower than −55 dB if P.O. regulations are to be met).
6. Connect the P.O. line to be used via the U-links. Feed tone at −10 dB to the *input* listen jack. Connect the high-impedance input of the T.P.M. to the *line* listen jack. Set *O/P GAIN* to give −10 dB on the T.P.M.
7. Set the input level to −30 dB. Connect the T.P.M. to the *output* listen jack. Set BALANCE to give minimum output.

issue 1
July 1979

SEND

INPUT

INPUT

B12

B11

T3

Y R B G

5

6

BALANCE-TO-UNBALANCING

C1 0·39
R3 150k
R8 100k
R9 100k
R1 100k
R13 10k
R2 100k
C2 0·39
R4 150k
R6 100k
R7 100k
+20V
IC1 741
10 dB loss

VOICE-OVER THRESHOLD PROCESSING

IC3 741
+20V
C7 33/16V
SET V.O. THRESHOLD
R14 10k
RV1 10k
R15 1k
C8 33/16V
R16 22k
0 – 21 dB amplification

9 To Voice-over (see page.8)

SEND PROCESSING

AMPLIFICATION

IC2 741
+20V
C6 22/16V
R10 390k
C5 33/16V
R11 10k
10k LIN. O/P GAIN
R12 1k
0 – 21 dB amplification

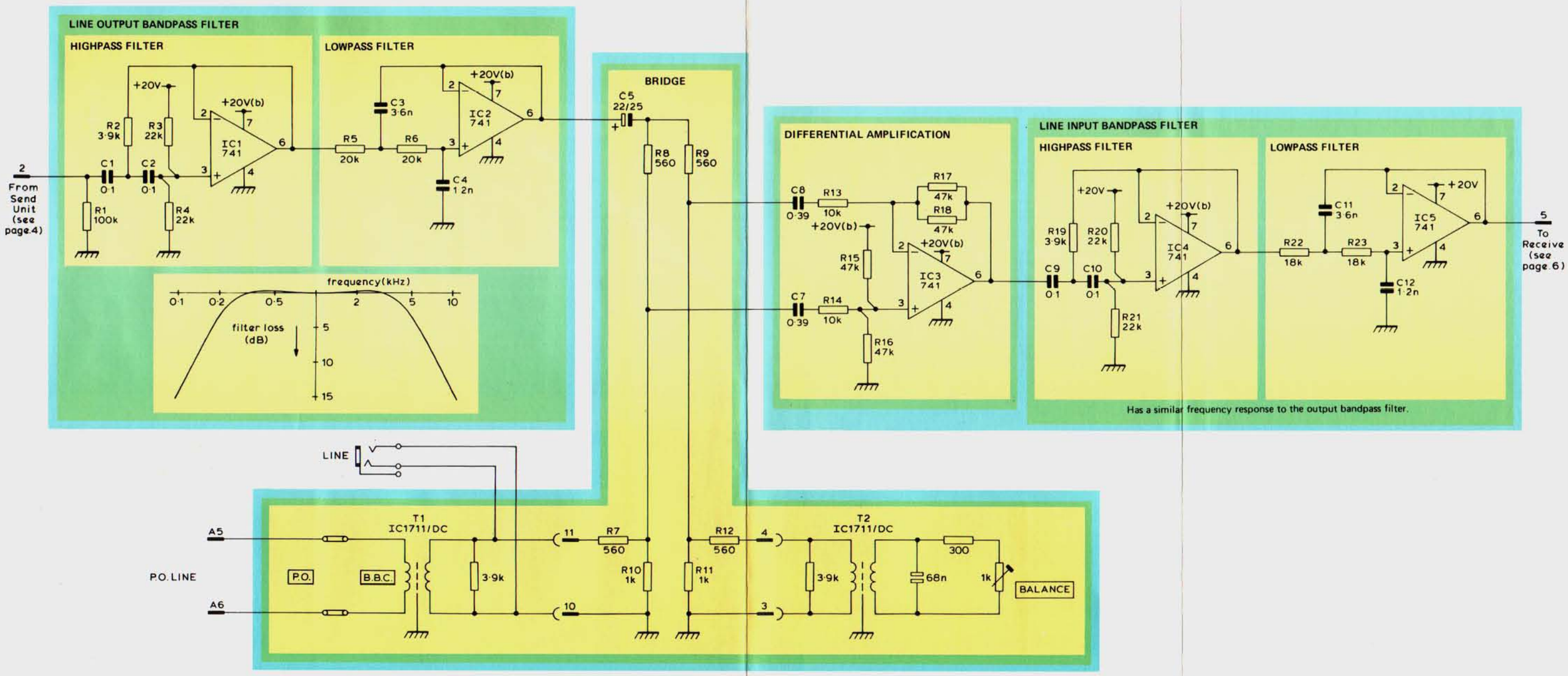
8 To Hybrid (see page.5)

REF	TYPE	BASE
IC1 IC2 IC3	741	 view on top

issue 1
July 1979

CHANGES

HYBRID CIRCUIT



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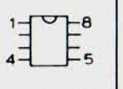
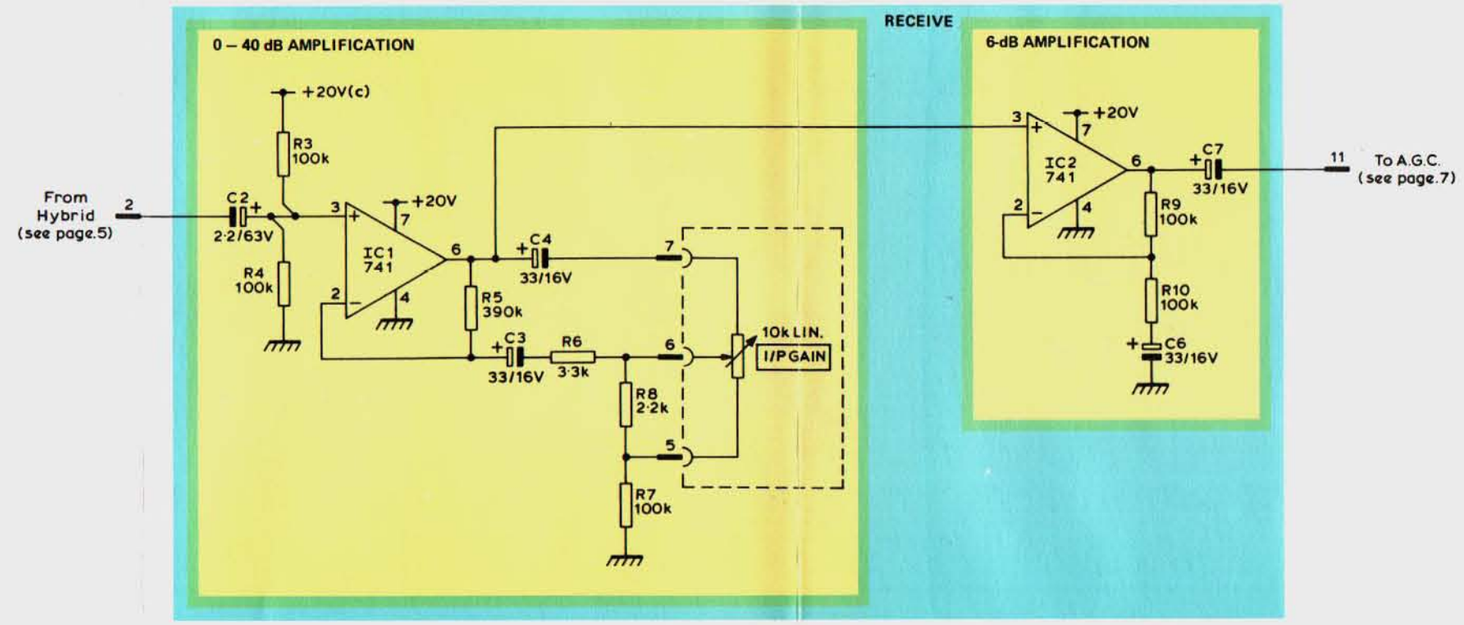
IC1 IC2 IC3 IC4 IC5	741	 view on top

RECEIVE CIRCUIT

CHANGES

issue 1
July 1979

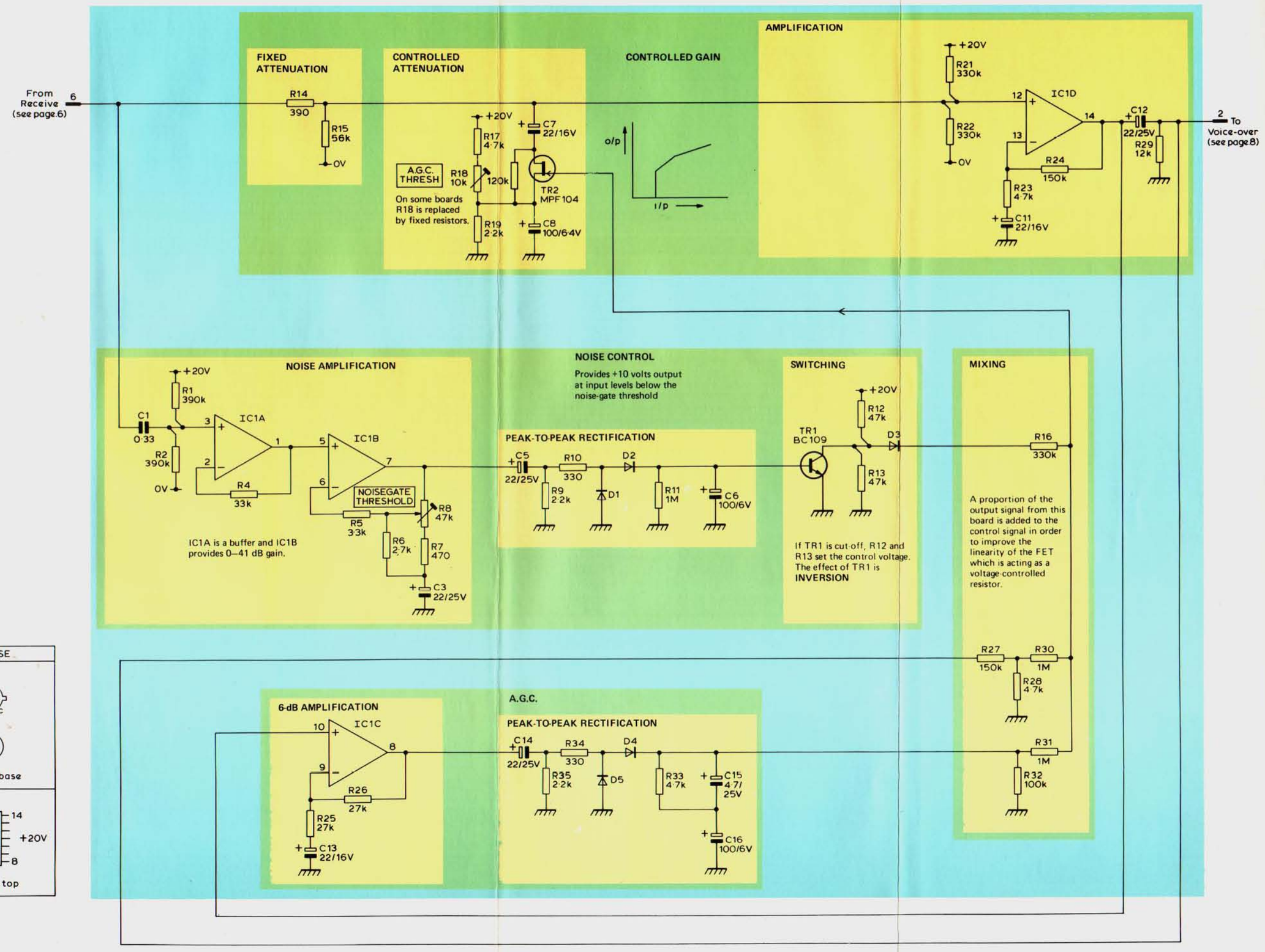


REF	TYPE	BASE
IC1 IC2	741	 view on top

issue 1
July 1979

CHANGES

A.G.C. CIRCUIT



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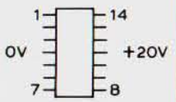
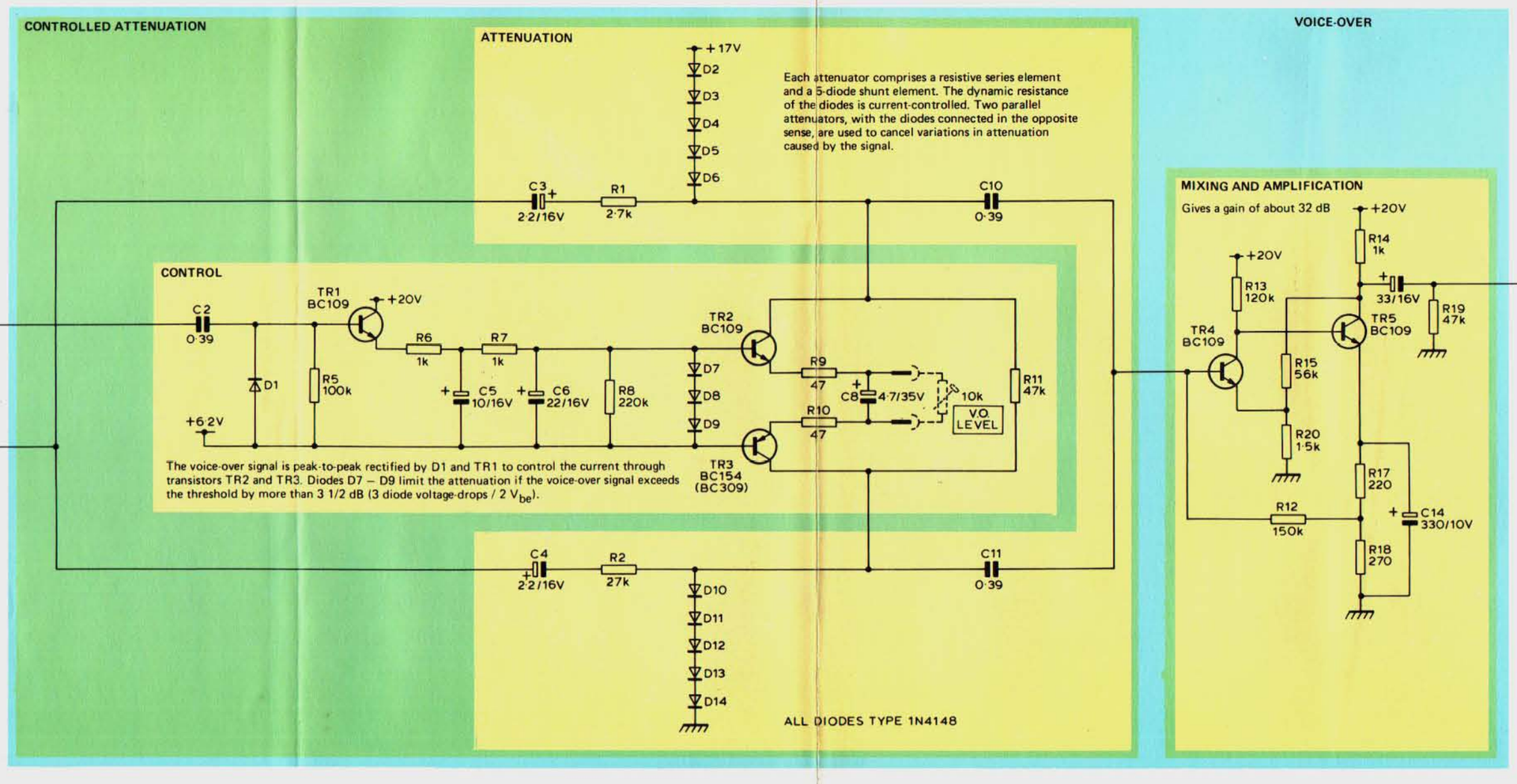
TR1	BC109	
TR2	MPF104	 view on base
IC1	41560	 view on top

VOICE-OVER CIRCUIT

CHANGES

issue 1
July 1979



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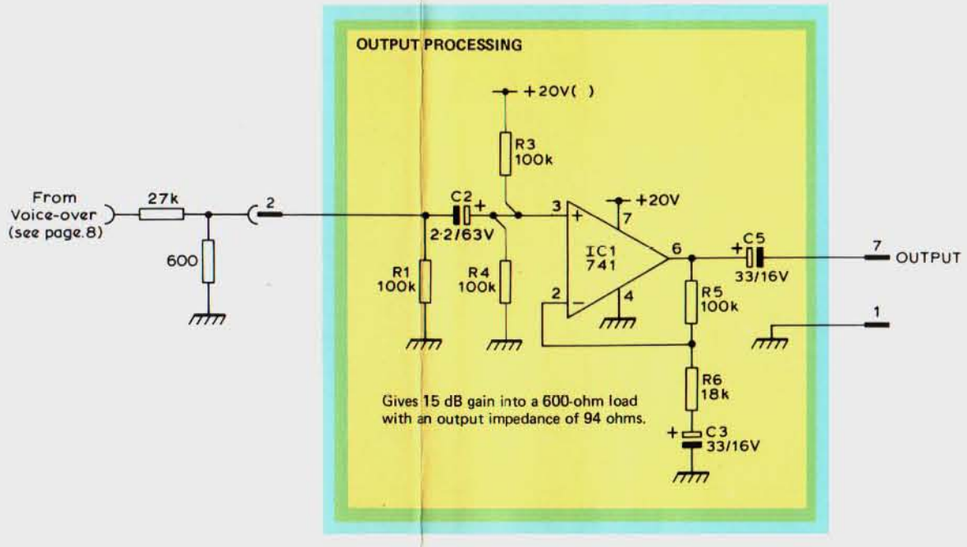
TR1-5	BC109	 view on base

issue 1
July 1979



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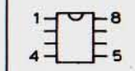
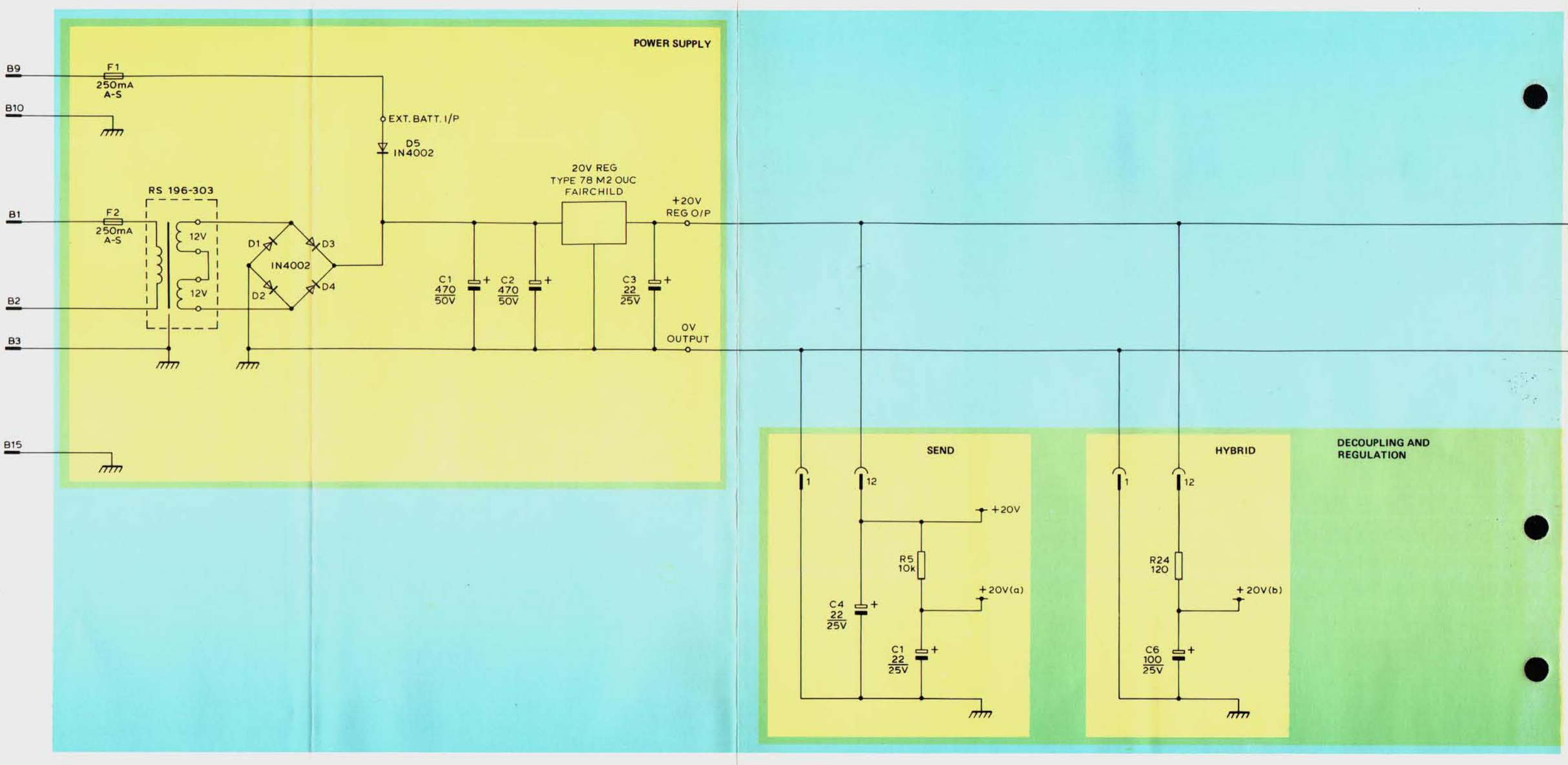
IC1	741	 view on top

issue 1
July 1979



issue 1
July 1979

CHANGES

POWER SUPPLY AND REGULATION

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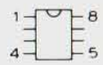
IC1	741	 view on top