



# Constant Volume Amplifiers

FOR USE ON RADIO TELEPHONE TERMINALS

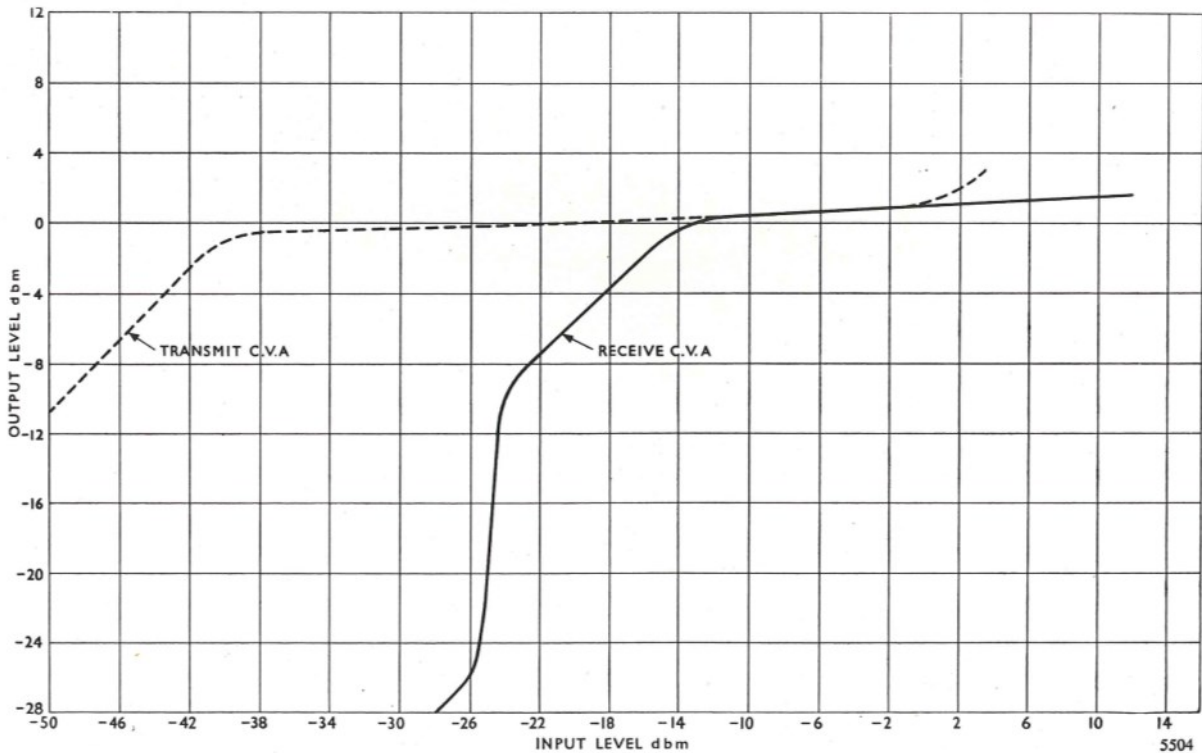
JOINT MARCONI-SIEMENS PRODUCT

THE USE OF RADIO LINKS for telephone communication presents a number of problems which must be solved if a quality is to be obtained equal to that of a normal land line. The two main problems to be considered are, firstly, a tendency for radio reception to fade and, secondly, the fact that radio paths may be noisy and unstable. To reduce the effect of these two conditions, constant volume amplifiers have been developed for use in both the transmit and receive path of a radio telephone channel.

The purpose of the transmit constant volume amplifier is to ensure that every subscriber will

obtain full modulation of the radio transmitter and thereby maintain the maximum possible signal to noise ratio at all times. It is found to be considerably more economical to control the volume of speech delivered to the transmitter by means of a constant volume amplifier than to design the transmitter so that its output power is always sufficient to overcome the noise even with the softest of speakers and yet not overload with the loudest of speakers.

The receive constant volume amplifier reduces the annoying effects of fading which are inseparable from HF radio links under most conditions.



It also ensures that during the intervals between passages of speech the noise level is not amplified up to give an output comparable with the signal level. On a single sideband HF link the CVA enables an AGC performance to be realised which could not be obtained from the radio receiver alone.

Both amplifiers have been designed for mount-

ing on the standard PO relay rack, which is 1 ft  $8\frac{1}{2}$  in. wide. A complete amplifier is mounted on a standard 5 unit panel, *i.e.*, 19 in. long  $\times$   $8\frac{3}{4}$  in. wide, and protected by a dust cover projecting  $4\frac{3}{4}$  in.

Although this method of mounting has been employed, it is quite feasible to arrange for the panels to be mounted in a cabinet.

## FEATURES

### TRANSMIT CVA

The gain of the amplifier is automatically adjusted to a value representative of the average incoming speech level so that the outgoing speech level is maintained constant.

A sudden increase in the incoming speech level produces a rapid reduction in gain so that the radio transmitter is protected from sudden overloads.

When the incoming speech ceases, whether for short or very long periods, the gain of the amplifier remains substantially unchanged.

In the absence of incoming speech, intermittent noise or speech crosstalk from other circuits whose level is not within about 28 db of the previous speech level, has no effect on the gain of the amplifier.

The amplifier has input and output impedances of  $600\ \Omega$  (balanced to ground) and a maximum

gain of 42.5 db which may be reduced by 6 db in 1 db steps. It will produce a constant output speech level of  $-10\ \text{db}$  ( $\pm 2\ \text{db}$ ) relative to reference telephonic power (RTP) for input speech levels ranging from  $-50\ \text{db}$  to  $-10\ \text{db}$  relative to RTP.

### RECEIVE CVA

With input levels below a certain predetermined value, approximately  $-25\ \text{dbm}$ , the overall gain of the amplifier is 0 db.

For inputs between  $-25\ \text{dbm}$  and  $-16.5\ \text{dbm}$  the gain is 16.5 db.

For inputs greater than  $-16.5\ \text{dbm}$  the gain is so adjusted that the output never exceeds 0 dbm. This holds for inputs up to  $+23.5\ \text{dbm}$ .

The amplifier has input and output impedances of  $600\ \Omega$  (balanced to ground) and a maximum gain of 19 db which may be reduced by 6 db in steps of 1 db.

**Marconi**

**MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED**

*Head Office: Marconi House, Chelmsford*

*Telephone: Chelmsford 3221. Telegraphic Address: Expanse, Chelmsford*