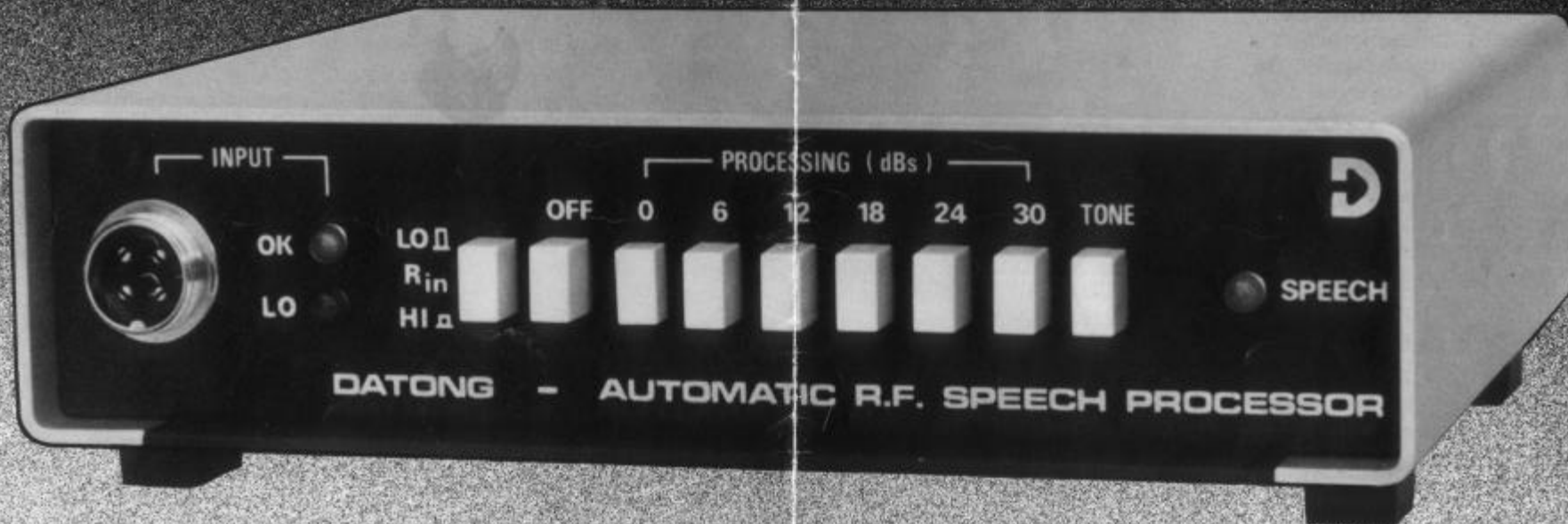


DATONG ELECTRONICS LIMITED

AUTOMATIC R.F. SPEECH PROCESSOR

Makes speech 'punchier' and easier to copy through interference. Ultra convenient to use.



MODEL ASP

MODEL ASP ADDS EASILY TO CONVENTIONAL SPEECH TRANSMITTERS AND IMPROVES TALK-POWER, RANGE AND SPEECH INTELLIGIBILITY IN NOISE.

Modern Amateur Radio communications take place amid great congestion and interference of all kinds. The vital objective is to have a signal which stands out from the rest.

Model ASP helps you achieve this in two ways. Firstly it increases the average power output from your transmitter. Secondly it makes your voice sound 'punchier' and louder for a given S meter reading.

Despite these very real benefits it simply installs in series with the transmitter's microphone.

FEATURES

- Makes speech 'punchier' and easier to copy in the presence of noise and interference. Increases transmitter range.
- Works with any transmitter, simply connects in series with microphone connection.
- Extremely easy to operate. Accurate push-button selection of 0, 6, 12, 18, 24 or 30 db. of true r.f. clipping to suit any conditions.
- Unique 'TONE' button simplifies transmitter adjustment.
- LO/HI microphone impedance selector built-in.
- Internal or external supply.

PROVEN EFFECTIVENESS

The technique of r.f. clipping used in Model ASP has been well proven in the many thousands of Datong R.F. clippers currently in use worldwide by amateurs and professionals. 'Datong clippers' have earned a reputation for giving clear punchy speech while increasing effective SSB signal levels by up to two 'S' points.

Now Model ASP gives all the same benefits but with the added convenience of automatic setting up adjustments and push-button selection of processing level.

APPLICATIONS

- SSB transmitters – Model ASP increases the useful radiated power without increasing the peak power. The benefit is com-

parable to an increase in P.E.P. of 6 to 10 db.

- FM transmitters – the peak deviation remains the same but the modulation sounds louder. If your signal is to be received in a noisy place, e.g. in a car, this can be a big help.
- AM transmitters – the effects are similar to those with FM.
- Any speech system which is peak power limited will be more effective if the speech input is first processed using Model ASP. An example is an Audio Public Address System.

HOLDS PEAKS CONSTANT, INCREASES THE REST

The objective behind the technique of r.f. clipping is simple: hold the peaks of the speech waveforms to a

constant level and bring up the level of the rest. In normal speech the peaks occupy only a small fraction of the total time yet the transmitter has to handle them without distortion otherwise you radiate 'splatter' on either side of your signal.

If you can increase 'the rest' without increasing the peaks you get more out of your transmitter. This means a bigger S meter reading plus greater readability at the far end.

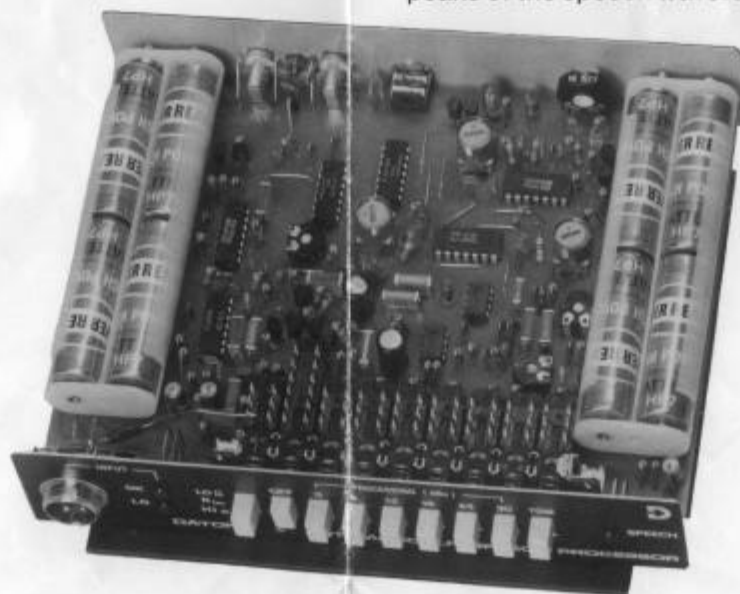
The objective is straightforward, the problem is how to achieve it without adding objectionable distortion.

WHY R.F. CLIPPING IS BEST

Model ASP and other Datong r.f. processors brilliantly achieve these aims using the technique of r.f. clipping. Although the processing changes the sound of your voice slightly it changes it for the better. It sounds 'punchier' and easier to read in QRM conditions.

The secret is to first convert the speech to SSB (at 60 kHz in Model ASP). Only then is it clipped and filtered. Finally the clipped and filtered SSB is demodulated back to audio.

By doing it this way, harmonics produced by the clipping are at multiples of 60 kHz, and easily removed by the 60 kHz filter. The result is increased speech power without harmonic distortion. In difficult conditions the improvement in your signal can make all the difference between 'no copy' and Q5.



EASY TO USE

Model ASP is unique in requiring virtually no setting up to suit individual voice levels or microphone sensitivities. Simply plug in the microphone, select the desired degree of processing by push-button, and talk.

Complex internal circuitry continuously assesses the peak voice level and adjusts the gain to give the set degree of processing. The system is designed to eliminate 'pumping' and other undesirable effects of simple automatic level setting devices. Note that this circuitry is in addition to the actual RF processing section.

PUSH-BUTTON CONTROL

Model ASP is controlled entirely by nine push-buttons.

Six buttons select r.f. clipping levels in steps of 6 db from 0 to 30 db. This allows you to match your signal to prevailing conditions. For example, 0 or 6 for local contacts, 12 or 18 for DX work and 24 or 30 for cracking pile-ups.

Of the other three buttons one switches the unit off (and bypasses it electrically), a second selects low or high input impedance. The third, labelled 'TONE', is another feature unique to Model ASP. It produces a constant sine wave at about 700 Hz and with a peak-to-peak level equal to the processed speech. You can set your transmitter microphone gain using 'TONE' in the knowledge that it will then be correct for any other button selection.

THREE LED INDICATORS

Three light emitting diodes allow you to monitor the correct operation of Model ASP.

If your voice input is within the very wide acceptance range of the automatic gain control, the 'OK' lamp illuminates.

If the input is not enough, or 5 seconds after you stop talking, the 'LO' lamp comes on. This indicates that the unit has raised its gain to maximum and can go no higher.

If the input is large enough to cause overload both 'LO' and 'HI' go off.

The 'SPEECH' lamp should illuminate only when you talk. If it stays on between syllables the message is "talk closer to the microphone to reduce background noise pick-up".

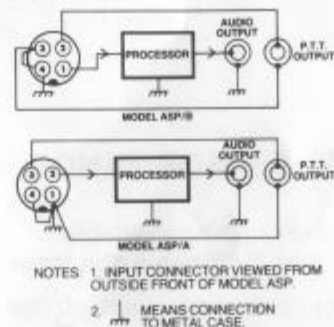
INSTALLATION INSTRUCTIONS

The two basic versions of Model ASP are wired as shown in the diagram. Model ASP/B is intended for use with transmitters made by TRIO/KENWOOD and Model ASP/A for those made by YAESU. Other wiring arrangements can be supplied on request. Please supply full wiring details with the order.

The input connection can easily be rewired if necessary to suit other transmitters. Details of the pin connections will usually be given in the manufacturers literature.

Ready made output leads to interface Model ASP to most commercial transceivers are available from Datong and details can be supplied on request.

When making up leads the use of screened audio-type cable is recommended with separate screens for the audio and the push-to-talk lines. In each case the outer braid should go to the outer screen of the phono connectors.



EXTERNAL POWER SUPPLY

An external DC power supply can be fed into the 3.5mm jack socket. The tip is positive and the sleeve is negative. TAKE CARE TO CONNECT WITH THE CORRECT POLARITY OTHERWISE DAMAGE MAY OCCUR. Any voltage between 6 and 16 volts is suitable and the current drain is only 15mA. A suitable supply is available from the accessory socket of many transmitters. Voltages higher than 16 volts can be used if a resistor is connected in series. A suitable resistor value in kilohms is (supply voltage-10)/15.

Direct connection can be made to a 12 volt car electrical system.

INTERNAL BATTERIES

To fit internal batteries remove the four feet fixing screws and slide off the outer case. Eight pen cells can then be fitted in the holders provided as shown in the photograph. Do not leave exhausted batteries in place and remove the batteries if the unit is to be stored unused for very long periods. Inspect batteries for leakage at six monthly intervals. Long battery life can be expected since the unit will still operate even when the battery voltage has dropped to half the voltage when new.

OPERATING INSTRUCTIONS

Setting up involves three straightforward steps.

STEP 1.

With the microphone plugged into the processor and the latter connected to the transmitter, switch the processor to 'off' and set up the transmitter in the normal way.

STEP 2.

Press 'TONE' and with transmitter operating adjust the 'OUTPUT LEVEL' preset (rear panel) so that the PA current meter (or other peak modulation monitoring device) indicates the desired peak operating current. Alternatively if the transmitter has an 'ALC' meter or indicator, increase the 'OUTPUT LEVEL' control until the ALC just begins to operate. (See CAUTION below).

STEP 3.

Select 'HI' or 'LO' input resistance on Model ASP to suit the microphone in use, select the desired amount of processing and talk into the microphone.

Basically that's all there is to it.

If the voice level is within the wide acceptance range of the automatic control system the 'OK' lamp should illuminate and remain illuminated for about five seconds after you stop talking. This indicates that the processor has 'learnt' and 'remembered' the voice level and has adjusted its gain accordingly. If 'LO' remains illuminated the input level is inadequate (check that the correct microphone impedance has been selected); therefore talk louder and/or closer to the microphone. If both 'LO' and 'HI' lamps go off during speech the input is too great for the processor to handle and distortion will occur.

Whenever the 'OK' lamp stays on you can be sure that the amount of processing is as indicated by the selected push-button.

For best results you should talk close into the microphone and hand microphones rather than desk microphones are recommended for this reason.

If the microphone appears to give too much or too little output, try using the 'wrong' setting of the ASP's input impedance switch.

CAUTION: Some transmitters may be damaged if the peak output is maintained for more than about ten seconds continuously, therefore adjustments using 'TONE' should be carried out quickly and if necessary in short bursts of say five seconds with similar rest periods in between. These are the same precautions that are normally observed when tuning a transmitter's power amplifier.

TYPICAL PERFORMANCE DATA

Degree of r.f clipping available
0 to 30 db in 6 db steps

Frequency response (with 0 db button pressed)
within ± 3 db from 400 to 3400 Hz

Total harmonic distortion (single input tone at 1 kHz, 30 db button depressed)
0.5%

Automatic control range: peak-to-peak voltage range required from microphone on voice peaks to allow

fully automatic control of processing level.

1.4 mV to 200 mV pk-pk (R_{in} 'LO')
10 mV to 1500 mV pk-pk (R_{in} 'HI')

Automatic control system:

'Hang' time 5 s
'Learn' time 1 s
'Attack' time 20 ms

Input impedance

680 ohms (R_{in} 'LO')
200 kilohms (R_{in} 'HI')

Nominal frequency of test tone ('TONE' button depressed)

700 Hz

Maximum output voltage on speech peaks

150 mV pk-pk (with preset output level control on rear panel set to maximum)

Supply voltage range (continuous operation)

6 to 16 volts

Max supply voltage (short duration only)

35 volts

Current drain

15 mA (independent of supply voltage above 6V)

Internal battery

12 volts; 8 standard pen cells (U12, UM3, HP7 or equivalent) in series

Provision for external supply
3.5 mm jack on rear panel

Dimensions

184 mm wide \times 153 mm deep
 \times 44 mm high (7.2 \times 6.0 \times 1.7 inches)
Feet add 10 mm (0.4 inches) to height

Finish

Anodised aluminium wrap around case.

Panels printed white on black.

Non-slip feet

Weight including packing

1 kilogram

Accessories

Supplied complete with plugs for all connectors (i.e. 4 pin mic. plug, two phono plugs, 3.5 mm jack plug)



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