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Number 25

# APPLICATION NOTE

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## Use of Stabilant 22a on Plastic Element Potentiometers

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### *BACKGROUND*

While plastic element potentiometers and faders have major advantages over the step type units, they do require some lubrication to extend their trouble-free life. Problems associated with malfunctioning or dirty elements include noise, microphonics, mis-tracking of dual controls, and even dropouts. And almost totally neglected has been the effect of thin film contamination on the total harmonic distortion of the audio signal, including the tendency of this distortion to lie in the more easily audible high-order harmonics.

### *APPARENT ACTION OF THIN-FILM CONTAMINANTS*

As an alternating current signal voltage passes through the zero voltage state, current ceases to flow (we're assuming a purely resistive load here); if a thin film of contamination is present, current may not start to flow again until sufficient voltage has built up across the contaminant so as to break it down. The result is a small notch in the signal which in sound is not dissimilar to the notch distortion of a class B power amplifier. The characteristic sound ranges from a "grainy" quality up to a harsh "glassy brilliance" overlaying the music.

### *THE USE OF STABILANT 22/22a*

By applying a thin coating of water-diluted **Stabilant 22** to the plastic element, the noise, dropouts, mis-tracking and these thin film distortion effects can be eliminated. While **Stabilant 22a** is thin enough to do the job, it is thinned with Isopropyl alcohol, and many plastic elements are adversely affected by this diluant. Therefore, a suitable lubricant can be prepared by adding three parts of hot water to one part of **Stabilant 22** (the concentrated form). Allow to cool before use. When applying, use only a small amount, perhaps one drop at the most and vigorously cycle the fader to distribute the film the entire length of the track! If the film thickness is too great a phenomenon called hydroplaning could occur. This is where the contacts push a film of the lubricant ahead of them, causing it to increase in thickness until immediate contact is lost between the very-low pressure of the wiper fingers and the plastic element. This is a case where more is NOT better!

### *SIMPLE VERIFICATION THAT AUDIBLE DISTORTION HAS BEEN REDUCED.*

If you want to do a comparison of the distortion effects of thin film-contamination, it is suggested that only one input channel be treated (including all the IC's, switches and connectors which should be treated with **Stabilant 22a**), and then and com-

pared with an untreated channel. The difference is usually audible as a smoother more musical sound on the treated channel.

### **PRECAUTIONS**

Again, keep the film thickness to a minimum. don't use **Stabilant 22a** on plastic element faders unless their manufacturer OK's the use of isopropyl alcohol (commonly called isopropanol).

### **REFERENCE**

Reference is made to Technical Note Number 24 "Effects of Stabilant 22 on Harmonic Distortion in Connectors", Application Note 4, "Microphone Connectors", Application Note 3, "Shadow Switches", Application Note 11, "Recording Studios", and Application Note 12, "Broadcast Equipment".

NATO Supply Code 38948 - 15 mL of S22a has NATO Part # 5999-21-900-6937

The **Stabilants** are patented in Canada - 1987; US Patent number 4696832. World-wide patents applied for. Because the patents cover contacts treated with the material, a Point-of-sale License is granted with each sale of the material.

**MATERIAL SAFETY DATA SHEETS ARE AVAILABLE ON REQUEST**

### **NOTICE**

This Application Note is based on customer-supplied information, and D.W. Electrochemicals Ltd. is publishing it for information purposes only. In the event of a conflict between the instructions supplied by the manufacturer of the equipment on which the Stabilant material was used, and the service procedure employed by our customer, we recommend that the manufacturer of the equipment be contacted to make sure that their warranties will not be voided by the procedures herein. While to our knowledge the information is accurate, prospective users of the material should determine the suitability of the Stabilant materials for their application by running their own tests. D.W. Electrochemicals Ltd. assumes no responsibility or liability for damage to equipment and/or any consequent damages, howsoever caused, through the use of the information herein.

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