Telecom AUSTRALIA

Office of Customer Affairs
Commercial & Consumer

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12 April 1995

Dr Gordon Hughes
Hunt & Hunt
Lawyers
Level 21
459 Collins Street
MELBOURNE VIC 3000

BY COURIER

Dear Dr Hughes

**Arbitration - Smith**

I refer to your facsimile of 7 March 1995 and the attached facsimile letter of 3 March 1995 from Mr Smith.

In relation to the "second document" referred to at paragraph 2 of the Claimant's facsimile I advise that Telecom is prepared to make available the further data being sought by the Claimant. That further data consists of :-

1. the telephone in question;

2. a report titled "Technical Report TF200 Customer Complaint"

A copy of the Technical Report is enclosed. As you will see there are two authors of that report and each author is available to provide a statutory declaration regarding the report if you so require.

The telephone can be provided to you if you so require.

Yours faithfully

Ted Benjamin
Group Manager
Customer Affairs

Encl: Technical Report

A63339

TB-OH011.DOC

| | | | |
|---|---|---|---|
| FAX FROM: | ALAN SMITH<br>C. O. T. | DATE: 3.3.95 | |
| FAX NO: | 055 267 230 | | |
| PHONE NO: | 008 816 522 | NUMBER OF PAGES (including this page) | |
| FAX TO: | **DR GORDON HUGHES**<br>**HUNT & HUNT**<br>**MELBOURNE** | | |

Dear Dr Hughes,

I am presenting two documents that I believe are relevant to the presentation of my submissions and my reply to Telecom's Defence documents, both of which have already been tendered.

*1.* ***Telecom document K02736*** is a copy of my advertisement in the Geelong Advertiser on 27th February, 1993. In reference to this document I would ask you, and the Resource Team, to review Telecom's Defence Witness Statement, Ray Morris, at 11 and 12. I believe you will find that this particular saga, referred to in Ray Morris's statements, relates to an inadvertent error made by the Geelong Advertiser, where they advertised an incorrect 008 number. However, Telecom document K02736 shows clearly that my (055) 267 267 number was printed correctly.

I find Telecom's conduct alarming, not only in their Defence Document, but also the suggestion, made on 13th July, 1993 by Miss Roseanne Pittard, Telecom General Manager, Commercial, that Telecom use this "wrong number" information to build credibility on Telecom's side, hoping that Senator Boswell (political briefings) and Austel would produce adverse findings in relation to the way I run my promotions and advertising.

A copy of the information just supplied regarding political briefings can be found in my second submission C/B/H/C titled "Cape Bridgewater 1" on page 70.

*2.* ***The second document,*** which is very relevant to a matter that I am most concerned about, relates to Telecom's Defence surrounding beer alleged to have been found in my 267 230 phone.

In my second submission, "Cape Bridgewater Part 1" (already presented), the fifth page from the back is a copy of an E-mail memo from Peter Gamble to Bruce Pendlebury, dated Tuesday 26th April, 1994. As you will see in the first paragraph, Peter Gamble had already described accurately what the problem was with my 267 230 phone as a result of his discussions with Les Churcher. From the following paragraphs in this document, addressed to varying Telecom departments, we could assume that there had been a known heat problem, together with problems associated with moisture, at the RCM.

I am not sure whether both these discussions are related to the moisture problem in the Exicom phones as presented in my supporting evidence in reply to Telecom's Defence (titled "Brief Summary, Telecom Witness Statement, Conflicting Evidence Summary, TF200"). Again I find that I must use the word 'alarmed' in relation to many examples where Telecom have mislead in their Defence Documents.

Dr. Hughes, how could Peter Gamble have such an assessment already worked out on 26th April, regarding this problem with my 267 230 phone, when the phone was not even collected from me until the following day, 27th April, 1994?

I also find it very alarming that Telecom did not issue any statements whatsoever regarding what they found on the 12th May, after the so-called forensic testing. Instead they waited seven months to spring their report. Had they told me of their findings on or around the date of 12th May, 1994, then they would have been obliged to allow me access to the phone and the material they used to gain this information.

I believe, as I have already stated in my reply to Telecom's Defence Documents, that Telecom must show not only the phone and original photos taken of the phone when it was given to the laboratories, but also all evidence used by the laboratories to derive this information.

Telecom Defence Document, Appendix 4 at 2, Telecom file note number K00934 is another example of the type of misleading statements made by Telecom: you will note that, on the day in question, 27th April, when this phone was picked up by Telecom, there is a statement made by DNF Waverley that, at 8.50am I told them I was tired and wanted to go to sleep. What I did convey to Waverley, however, was that I had been fighting an out-of-control fire from 8pm the previous evening until 8.30am that morning and that I would require three hours sleep before a Telecom representative called to test my phones (this information regarding the fire can be obtained from the Cape Bridgewater CFA log book).

I hope these two examples from Telecom, presented here, will be accepted as part of my claim.

Yours sincerely,

Alan Smith.

Telecom AUSTRALIA

Commercial and Consumer

## Technical Report

# TF200 Customer Complaint

Telstra Corporation Limited
ACN 051 775 556

Contents

## 1. Initial Report

### 1.1 Background

A suspect TF200 reported as being involved in a customer complaint, was received from Mr Peter Gamble, 8/242 Exhibition Street Melbourne, Friday 6 May 1994.

The suspect TF200 was an Exicom telephone with manufacturing date of week 13 year 1993.

The customers name is Mr A. Smith, Tel 055-267230, from Cape Bridgewater, Portland Victoria.

The investigating technician was Mr Ross Anderson.

The suspect TF200 was replaced by Mr Ross Anderson on 27 April 1994.

### 1.2 Reported Fault Symptoms

Mr Ross Anderson reported on a Customer Equipment Fault Label the following comments:

> The customer said the phone stays off-hook when hung up.
>
> Mr Anderson then advised that it stays connected for 2 seconds after hang-up.
>
> Mr Anderson then reported that on 28 April 1994, he tested the phone at his depot, and when first plugged in it would not disconnect when hanging up. After several minutes of being plugged in it would then hang up with the 2 second delay. He reported that it took up to 15 seconds if the phone was left unplugged for a period of time..

### 1.3 Initital Inspection

The suspect TF200 telephone when received was found to be very dirty around the keypad with what appeared to be a sticky substance, possibly coffee.

The investigating technician had engraved the customers phone number, the date and his name into the top cover and the customer also engraved his signature.

### 1.4 Confirmation of Fault.

10 May 1994

The suspect TF200 was connected to a CustomNet Line on 10 May 1994 and checked for the reported fault symptoms. The simple test included the establishment of a call to the suspect telephone, confirming that the telephone functioned normally, and then hanging up the suspect telephone.

The handset of the suspect TF200 was then tapped near the microphone and it was confirmed that the tapping could be heard at the other telephone for up to 10 seconds. After approximately 10-15 seconds the loop was lost.

The line was disconnected and the handset was taken off-hook and the line re-connected, dial tone was received immediately. This process was repeated with the handset off-hook and the switchhook operated manually to hang up the telephone. When the line was connected, dial tone was received immediately the switch was released.

A call was then made to confirm operation of the keypad. A call was successful and the switchhook was once again operated. Conversation was still possible for some 15-20 seconds, then the call was lost, no dial tone was received. When the switchhook was released again dial tone was received.

The suspect telephone was carefully opened to check for any internal physical damage, and was found to have a significant amount of some tacky substance in the base. The substance was still tacky to the feel and was suspected to be coffee stains. The tacky substance was also evident around the membrane switchhook area. There was no other apparent physical damage evident to the telephone circuit board.

It was noted that the tacky substance was also under the membrane switchhook and was causing the membrane to attached to the surface of the telephone case.

There was also evidence of the tacky substance around other surfaces within the telephone case implying that the if a spillage had occurred and had got into the telephone that the customer may have tried to shake the substance from the phone thus causing it to splash around the inside of the case.

### 1.5 Preliminary Conclusion

The mis-operation of the phone suggests a failure of the switchhook circuitry or the membrane switch.

## 1.6 Recommendation

Detailed testing by Telecom Research is recommended as the next stage of the investigation.

May 12 1994

The suspect telephone was taken to Telecom Research Laboratories to investigate the failure mechanism further.

Before any work was to be done on the suspect telephone by Telecom Research they will take photographs of the complete telephone inside and outside. Photographs will also be taken of the telephone during each stage of the investigation to ensure accurate records of all actions taken.

Telecom Research will test for details of the tacky substance found inside the telephone and determine if it has contributed to the mode of mis-operation.

Telecom Research will also check the circuit board for damage caused by the substance.

Other tests will be used to assess the nature of the mis-operation if the cause is by a circuit failure or faulty component.

Investigating Officer

Ray Bell
Mgr Technical Liaison
Customer Equipment Division
12 May 1994

## 2. TRL Report

### 2.1 Background

The Exicom TF200 causing customer complaint was delivered to TRL by Ray Bell, Technical Liaison, CED on 12/5/94: The fault symptoms, as recorded in a document by Ray Bell, were evident when the phone was tested for normal operation on a Customnet extension on arrival at TRL.

### 2.2 Initial Investigations

The hookswitch operation in a TF200 is implemented electronically. The hookswitch is in effect just another input from the keypad and the whole keypad sub-assembly relies on the performance of a flexible circuit layer. In 1993 Exicom began sourcing these flexible circuit layers from a new manufacturer and a large number have failed in the field. The phone under investigation has a flexible circuit layer from the batch known to experience problems.

The on/off-hook signal from the flexible circuit layer is detected by the dialler IC on the main printed board assembly and this IC then drives a series of transistors which cause the telephone to loop the line. The fault symptom of a delay in the phone returning to its on-hook state after a call could thus be either due to problem in the flexible circuit layer or on the printed board assembly. The first step was to isolate to problem to either the printed board assembly or the flexible circuit layer.

The TF200 can be made to go off-hook either by lifting the handset or by connecting pins 5&6 at the line-cord socket. This facility was provided to allow expansion modules to be fitted to the TF200. If the phone is taken off-hook by connecting these two pins, the hookswitch part of the flexible circuit layer is not used. (figure 1)

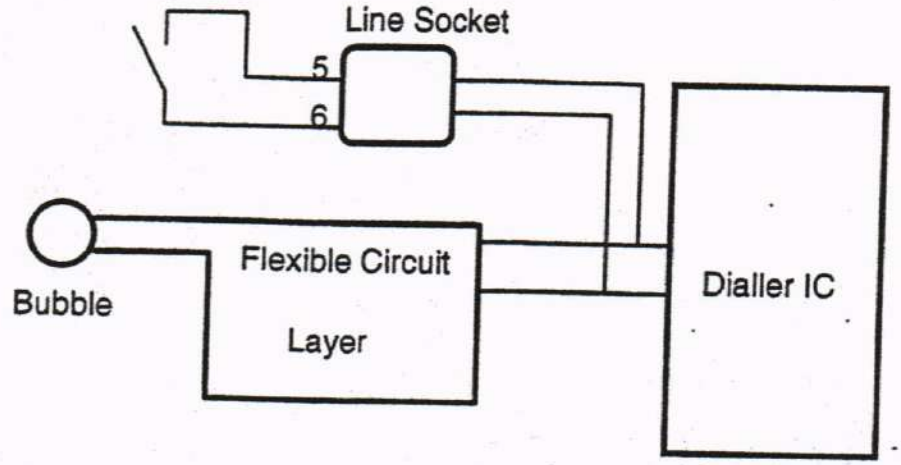


**Figure 1. Hookswitch configuration in the TF200**

The phone under investigation was taken on and off-hook repeatedly by connecting pins 5&6 and operated normally without any delay in returning to its on-hook state. This strongly suggested that the problem was related to the operation of the flexible circuit layer.

## 2.3 Internal Inspection

The phone was opened carefully and photographs taken to record the condition of various components. It was clearly evident that a brown coloured liquid had somehow entered the phone and spread internally before drying to a sticky residue. Of particular concern was a patch of this liquid residue under the part of the flexible circuit layer which extends beyond the keypad to provide the hookswitch function. It was found that this residue had caused the hookswitch extension to adhere to the upper part of the TF200 case when the various sub-assemblies were dismantled for individual testing.

This sticky residue has been analysed at TRL and contains chemicals typically found in beer. Coke and coffee (with sugar) were also considered but eliminated. It is difficult to be certain as there is a huge range of beers each with its own chemical composition. Further analysis can be done if it thought essential that this substance be identified conclusively.

## 2.4 Substitution of the Flexible Circuit Layer

After the various components of the phone had been removed from the case each was tested separately. A new flexible circuit layer was plugged into the original printed board assembly and the phone went on/off-hook normally.

The original flexible circuit layer was then tested on a resistance meter to establish if this circuit layer had become leaky as had occurred with many others in the field, particularly in humid regions. The resistance measured above 100 Mohm which is well above the specification of a minimum of 10 Mohm.

The operation of the actual switching action of the hookswitch bubble in the flexible circuit layer was also checked. A resistance measurement was made between pins 13 &14 of the flexible circuit layer and pressure applied to the "bubble" extension. Without pressure applied the resistance was more than 100 Mohm but when squeezed, the resistance dropped to about 100 ohm. When the pressure was released the resistance immediately returned to its nominal "open circuit" state of hundreds of Mohms. This would cause the phone to quickly return to its on-hook state.

It was thought that some of the sticky residue may have somehow entered the "bubble" that forms the hookswitch causing the two surfaces to stick together for a short time after the pressure is released. The "bubble" is formed by glueing two sheets of plastic together with a spacer in between. For reliable operation the seal around the bubble needs to be air-tight and thus, unless defective, could not allow the entry of any liquid.

The glue seal on the flexible circuit layer from the phone under investigation was visually inspected appeared to be satisfactory. (figure 2) The sticky residue is brown in colour and no discolouration is evident in the area of clear plastic around the outer perimeter of the bubble. This suggests that no liquid has managed to enter the bubble.

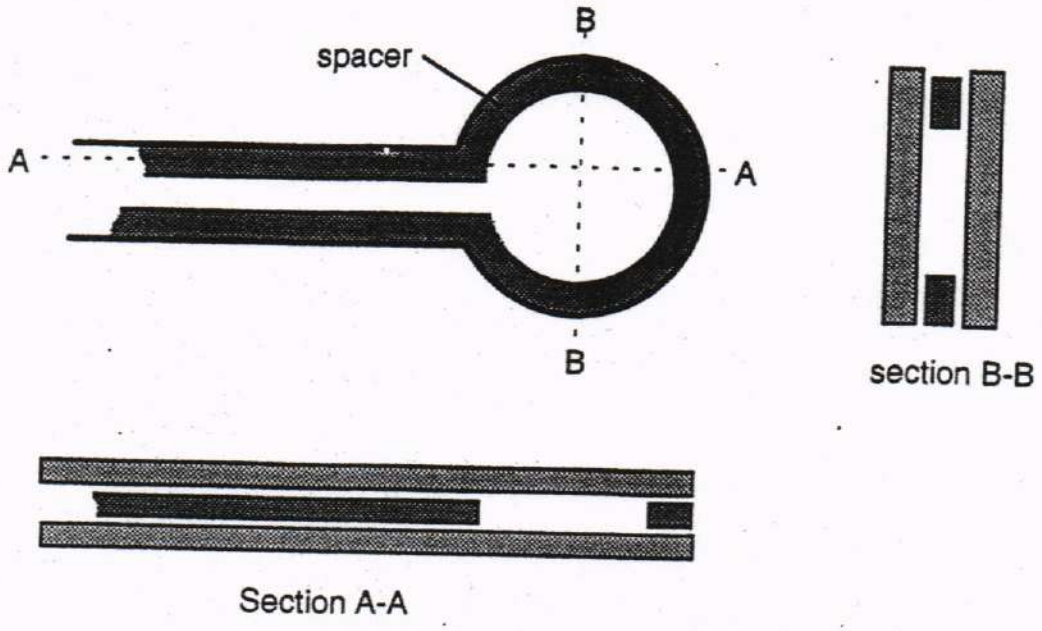


**Figure 2. Diagram of hookswitch Bubble construction**

## 2.5 Plastic Case

The upper part of the TF200 case from the phone was examined with attention being directed to the area inside where the hookswitch part of the flexible circuit layer normally rests. As mentioned earlier, some sticky residue was present in this area. It hard to imagine how this material came to be in such a position unless the phone was shaken or tipped upside-down after the spill.

Another point of interest is the plastic moulding itself. In comparing it with a number of other Exicom cases with date codes either side, a few differences become apparent. Denis O'Leary, TF200 Product Manger at Telecom Technologies has been asked to investigate this variation in case moulding further with Exicom.

In many plastic cases the hookswitch bubble sits on a flat surface but in this particular phone there is a small raised area in the plastic which is positioned almost exactly above the centre of the bubble. This feature has also been found in some other plastic cases and Denis has been informed that Exicom introduced this "improvement" in weeks 38 to 45 of 1992 to overcome wear in their tooling. It caused some problems in the field particularly with wall-mounted phones not hanging up properly. However, this phone was made in

week 13 of 1993 so it is not clear why this case has this raised area under the hookswitch.

The plastic moulding of this phone also has some features not seen in any other case before but are not thought to be causing any problems.

## 2.6 Explanation of Fault

The sticky residue in combination with the extra raised area in the plastic case has caused the problem of delayed return to on-hook conditions. The sticky residue is found either side of the raised area and when the phone is taken off-hook the flexible circuit layer is pressed against this sticky surface. **It is thought that after the handset is replaced and the pressure is removed the circuit layer remains stuck to the plastic case. Because the surface is not flat the flexible circuit layer is distorted sufficiently to cause the switch function in the bubble to operate.** Sometime after the handset is replaced (about 15 seconds) a part of the flexible circuit layer becomes unstuck and it returns to its undistorted shape. The hookswitch then operates normally, returns to a very high resistance and the phone goes into an on-hook condition. (figure 3)

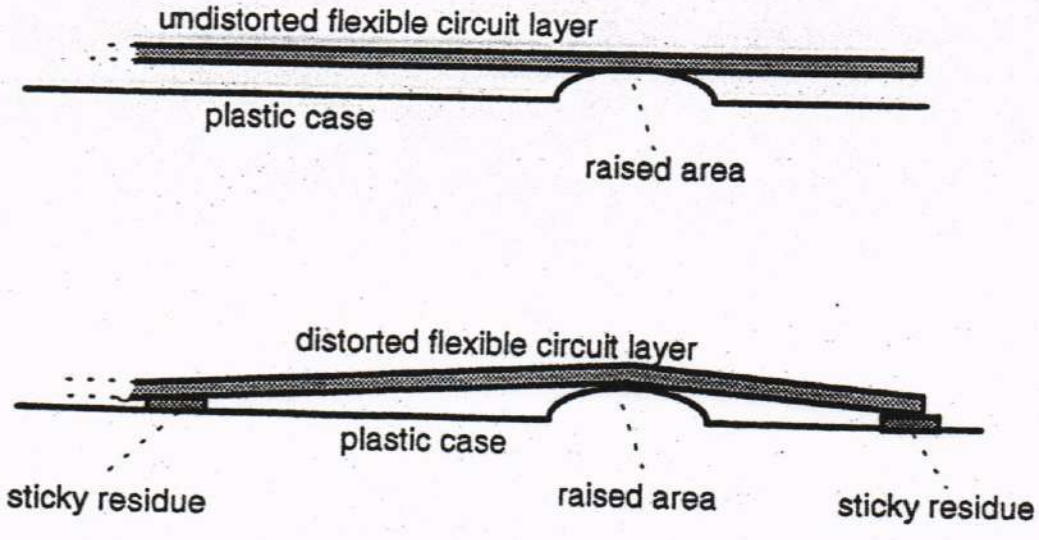


**Figure 3. Flexible Circuit Layer in undistorted and distorted shape when stuck to the case.**

## 3. Conclusion

The TF200 replaced on 27 April 1994, was suspected of a fault condition which caused the telephone to hold the line after the handset was placed on-hook.

The fault condition as documented by the fault technician Mr Anderson was confirmed on 12 May 1994.

The nature of the fault may have been reported as No Dial Tone, not receiving calls, or always busy.

The cause of the fault condition has been confirmed by Telecom Research to be due to the presence of a foriegn substance possibly beer inside the telephone case which directly caused the incorrect operation of the telephone membrane hookswitch. When the hookswitch was removed from the foriegn substance, the telephone operated correctly.

Accordingly, the fault was not caused by a defective TF200 telephone as was originally reported, but was the direct result of failure by the customer or other person, to report an accidental liquid spillage which entered the telephone case, resulting in failure of the hookswitch. The state of the telephone when received suggested that the telephone was not well cared for by the customer.

If the customer had reported the liquid spillage when it occurred the telephone would have been replaced under standard maintenance procedures with no resultant loss of business.

It is important that suitable guidelines be issued to field staff attending fault reports on rented telephones to note the conditions under which the Telecom property has been installed. It is the customer responsibility to look after the telephone and ensure that it is kept in a safe environment. It is Telecom's responsibility to ensure the telephone is installed in a safe location.

R. Bell

R. Bell
Manager Technical Liaison
Customer Equipment Division
20 June 1994.

The length of the delay for the phone to return to its on-hook condition is variable. If the handset is lifted the pressure on the hookswitch bubble comes from the spring inside the phone. The time for the sticky residue to release part of the flexible circuit layer appears to be related to how long the pressure has been applied; ie. it will hang up with a shorter delay following a short call. Longer delays could be achieved by applying considerably more pressure with a finger. This is only possible with the rear of the case removed. This too was time dependent with a long, hard push causing a longer delay. The stickiness of residue would also depend on the temperature and humidity at the time and the delay experienced by the customer could have been longer than the 10-20 seconds witnessed in the laboratory. The stickiness is also expected to decrease with time as the residue dries and collects a surface film of dust so again the customer may have experienced a greater problem than seen in the laboratory.

The flexible circuit layer from the phone under investigation was found to be far more sensitive to distortion than other samples of similar circuit layers. New flexible circuit layers from both Exicom and Alcatel could be flexed through more than 90 degrees before the switch function went to a low-resistance state. With the circuit layer from the phone under investigation only a small amount of flexing (<30 degrees) would activate the switch.

At this stage the flexible circuit layer from this phone has not been physically altered. To examine the hookswitch bubble in more detail it would need to be peeled open but once this is done the faulty operation can no longer be demonstrated. Once opened the bubble could be examined for ingress of the sticky residue and dimensional tolerances checked against other samples. This particular circuit layer may have a thinner spacer than normal.

Douglas Kuhn
Telecom Research Laboratories
03 253 6673
June 1st 1994

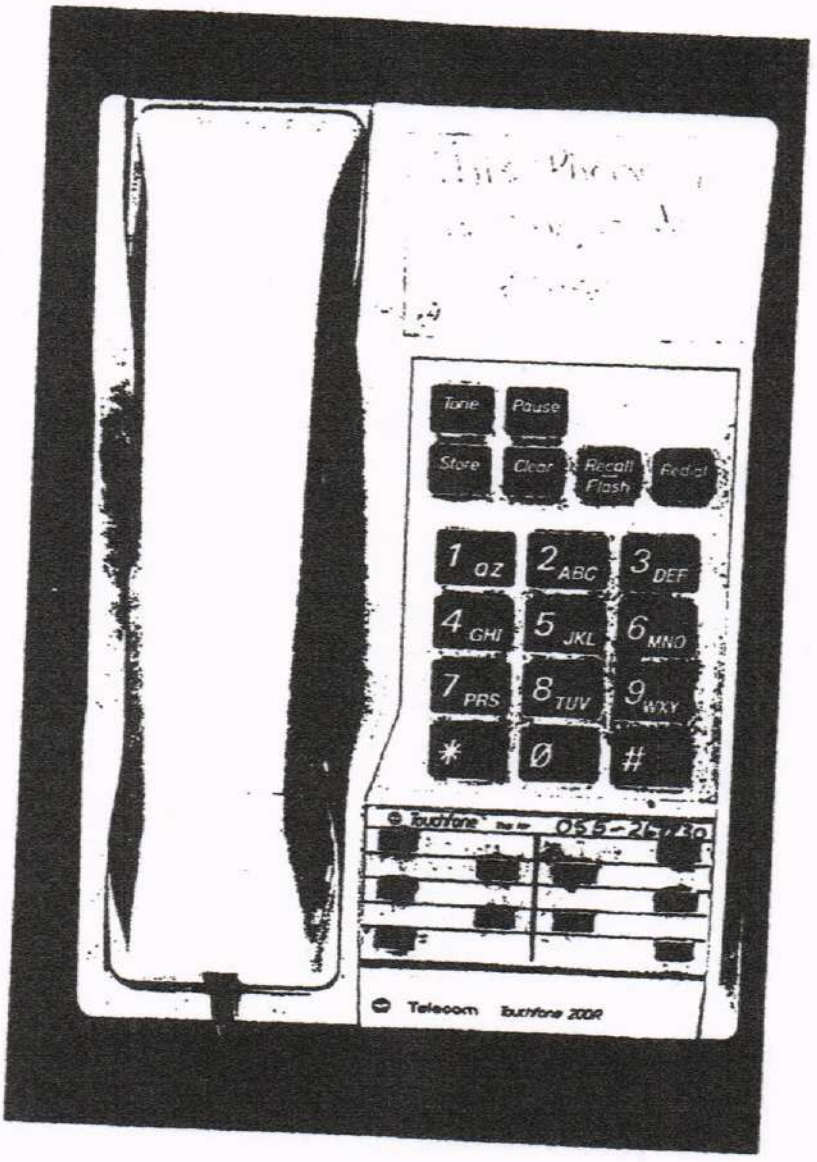


Photo 1. Front view of COT TF200

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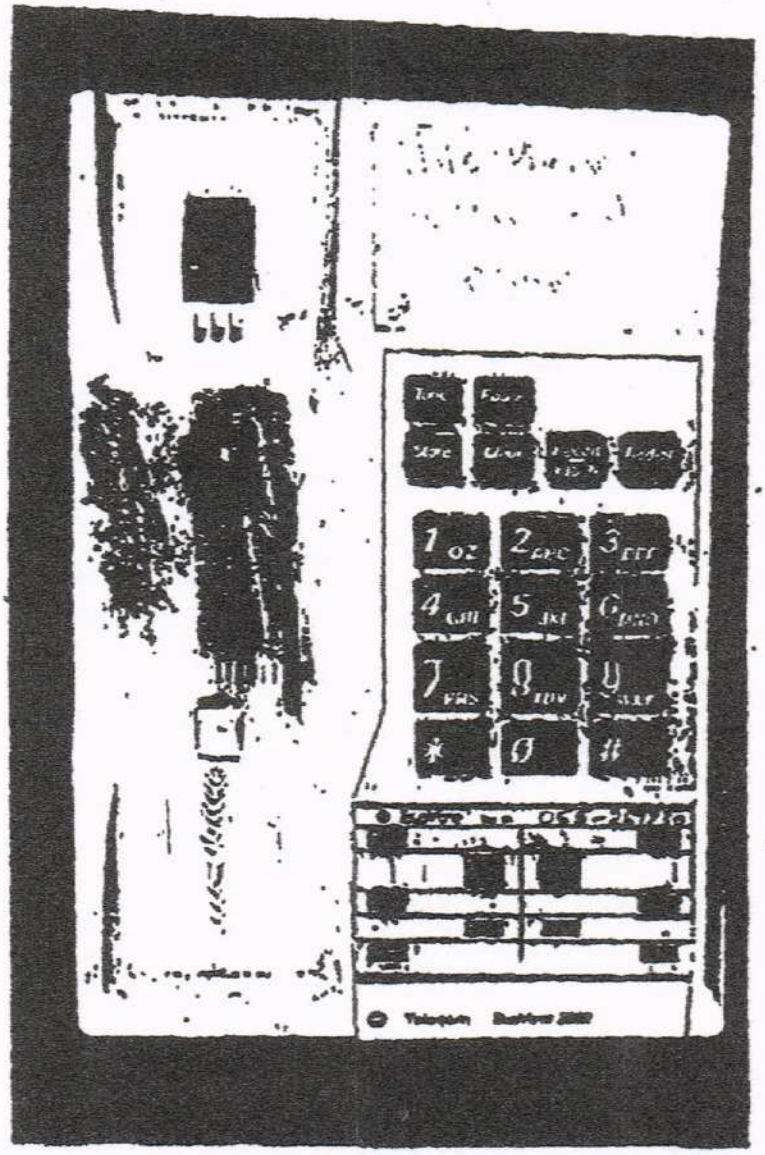

Photo 2. Front view with handset lifted indicating engraved markings on case

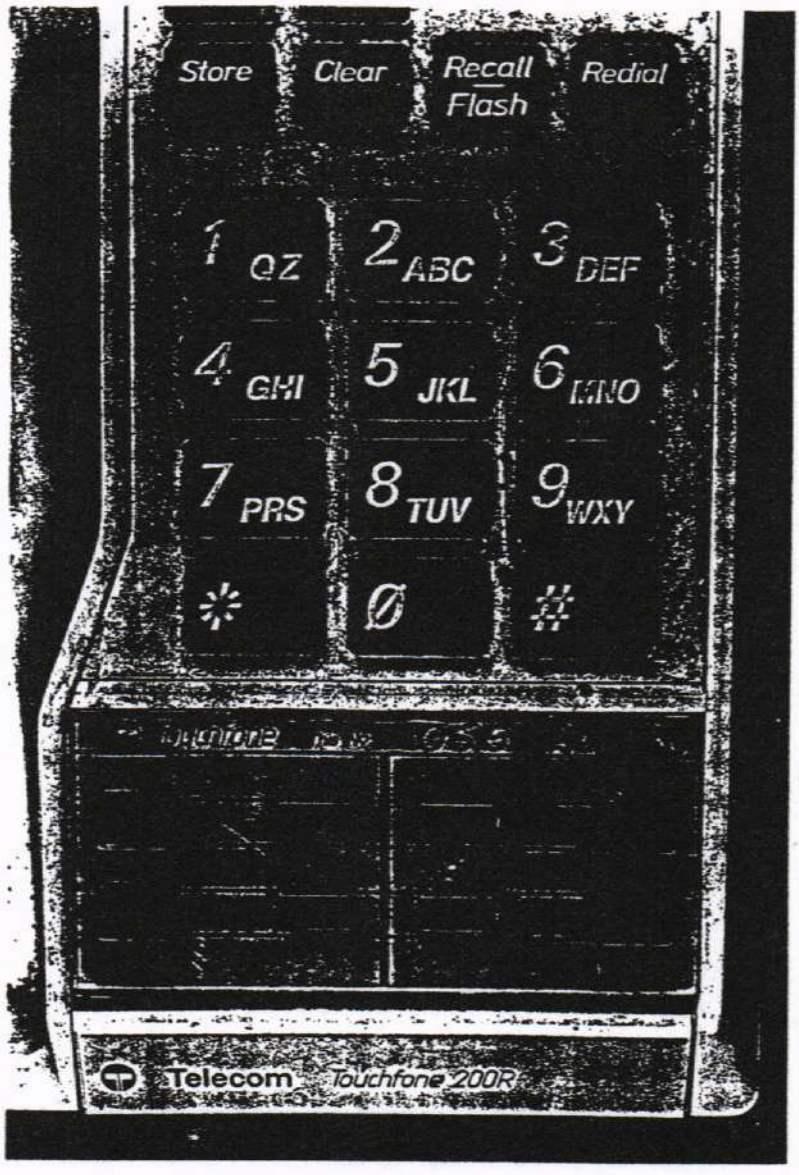


Photo 3. Close-up of keypad indicating dirty condition and showing customer's number

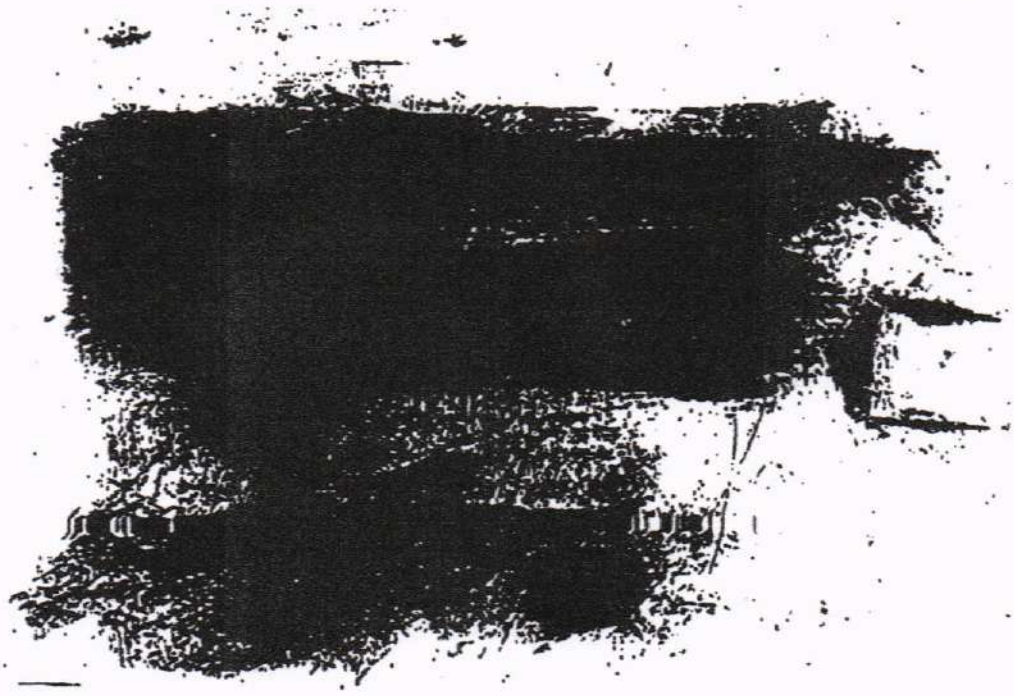

Photo 4. Close-up of engraved information on case

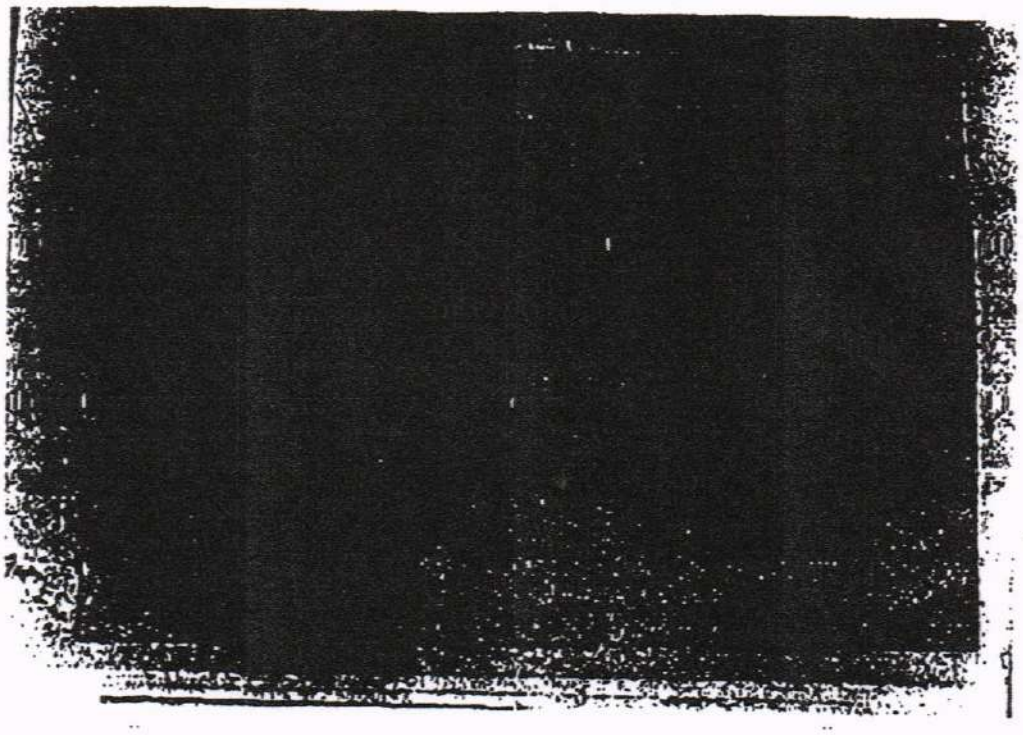

Photo 5. Close-up of label stuck to case above keypad

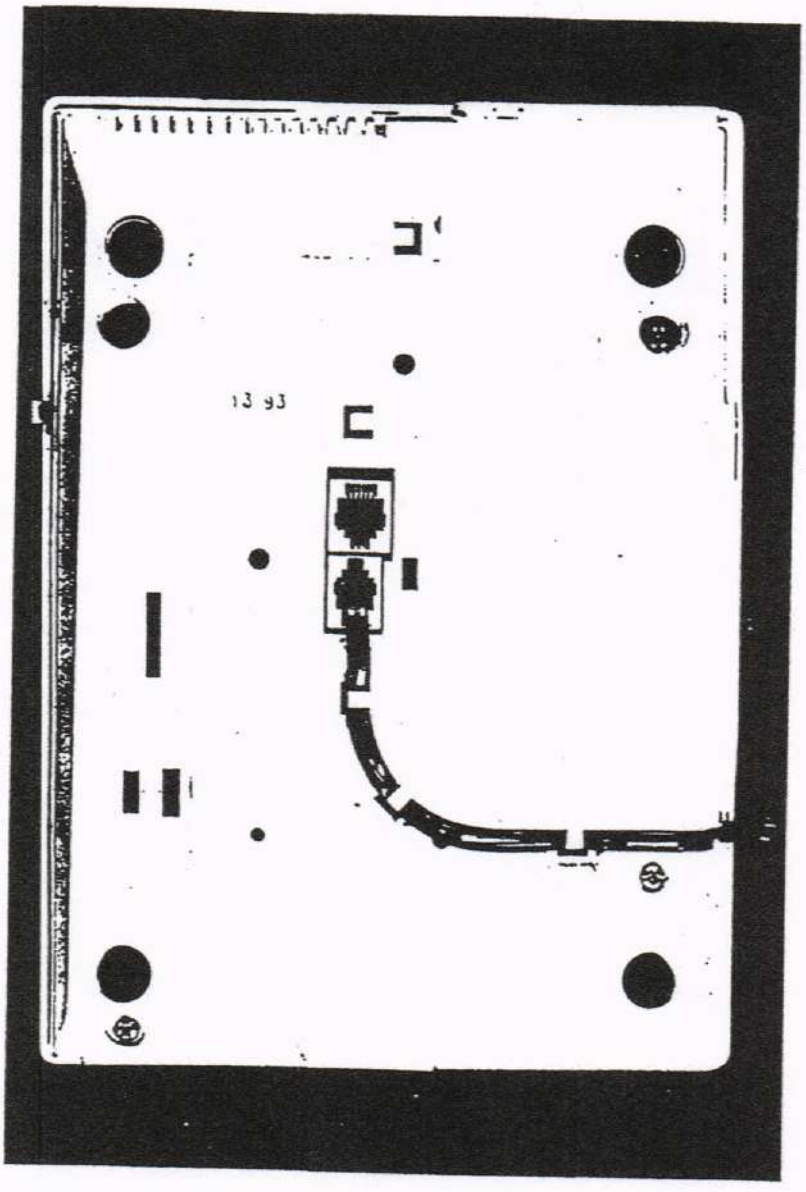

Photo 6. Back view of TF200

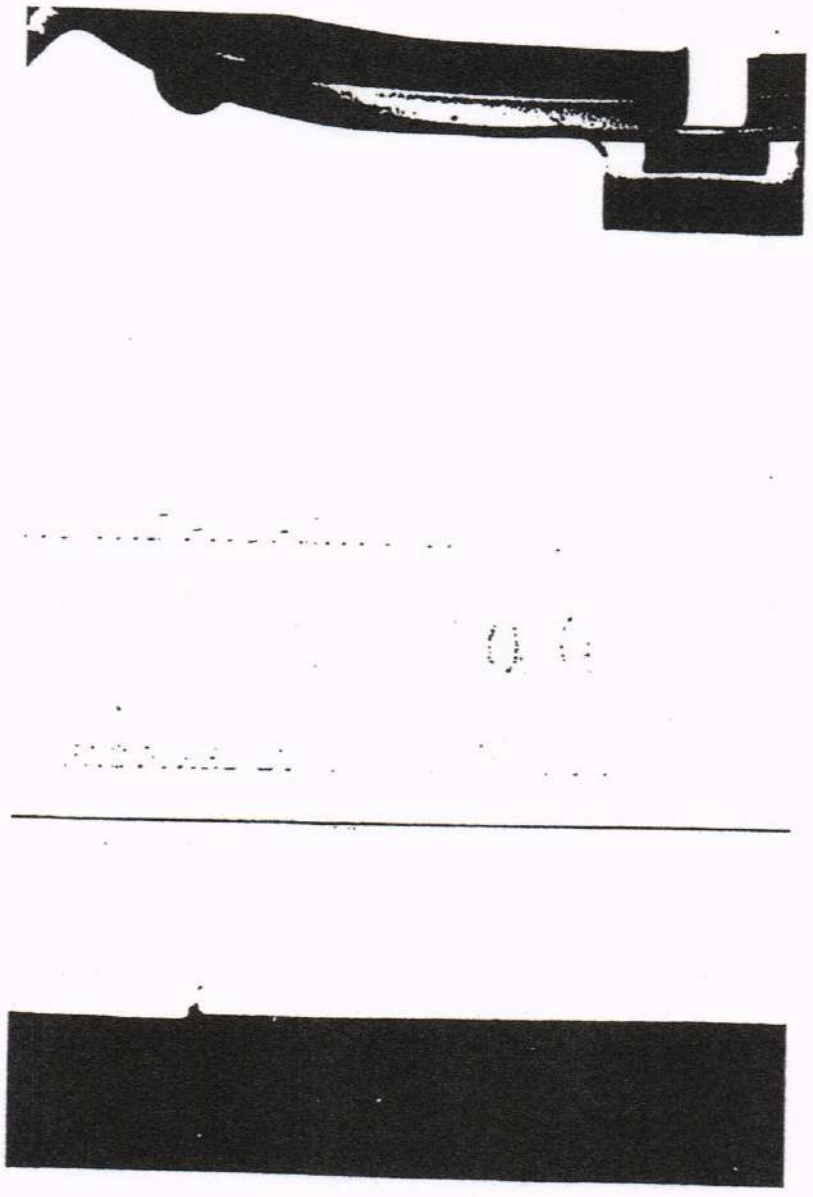

Photo 7. Close-up of back showing manufacturer and type (Exicom 550-200)

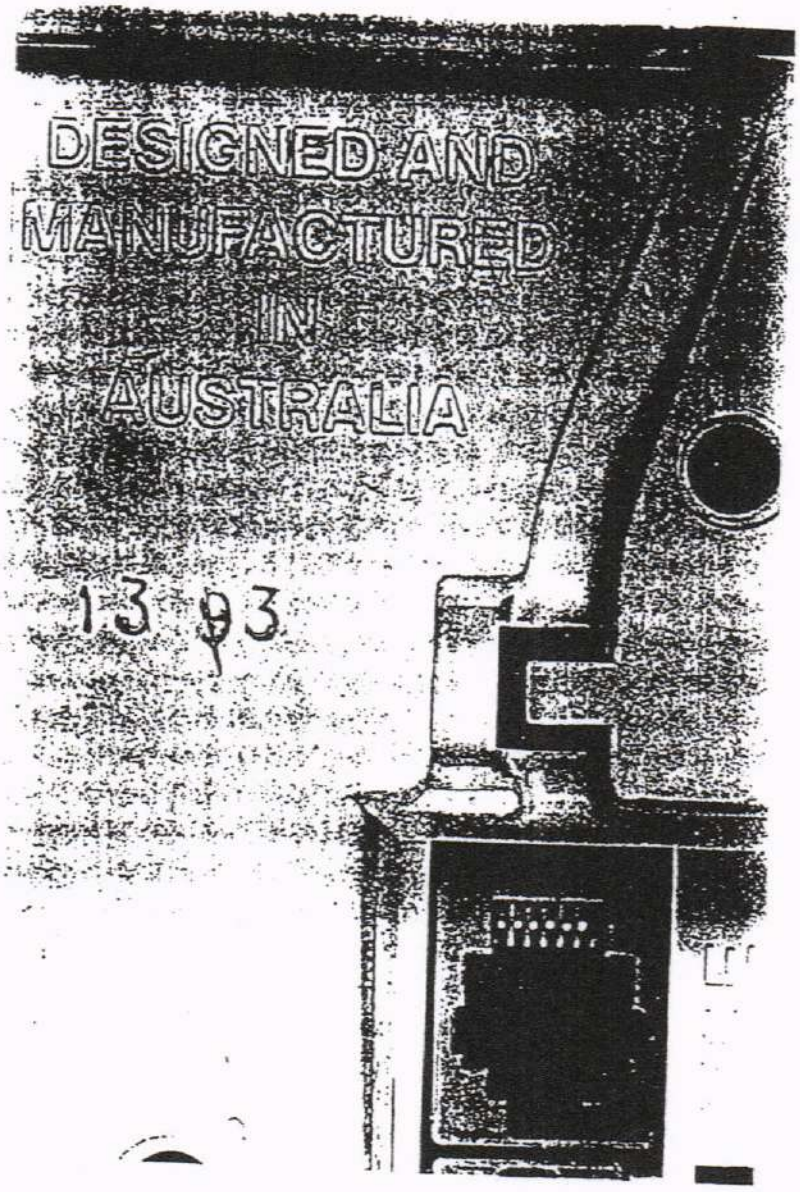


Photo 8. Close-up of back showing date of manufacturer (week 13 of 1993)

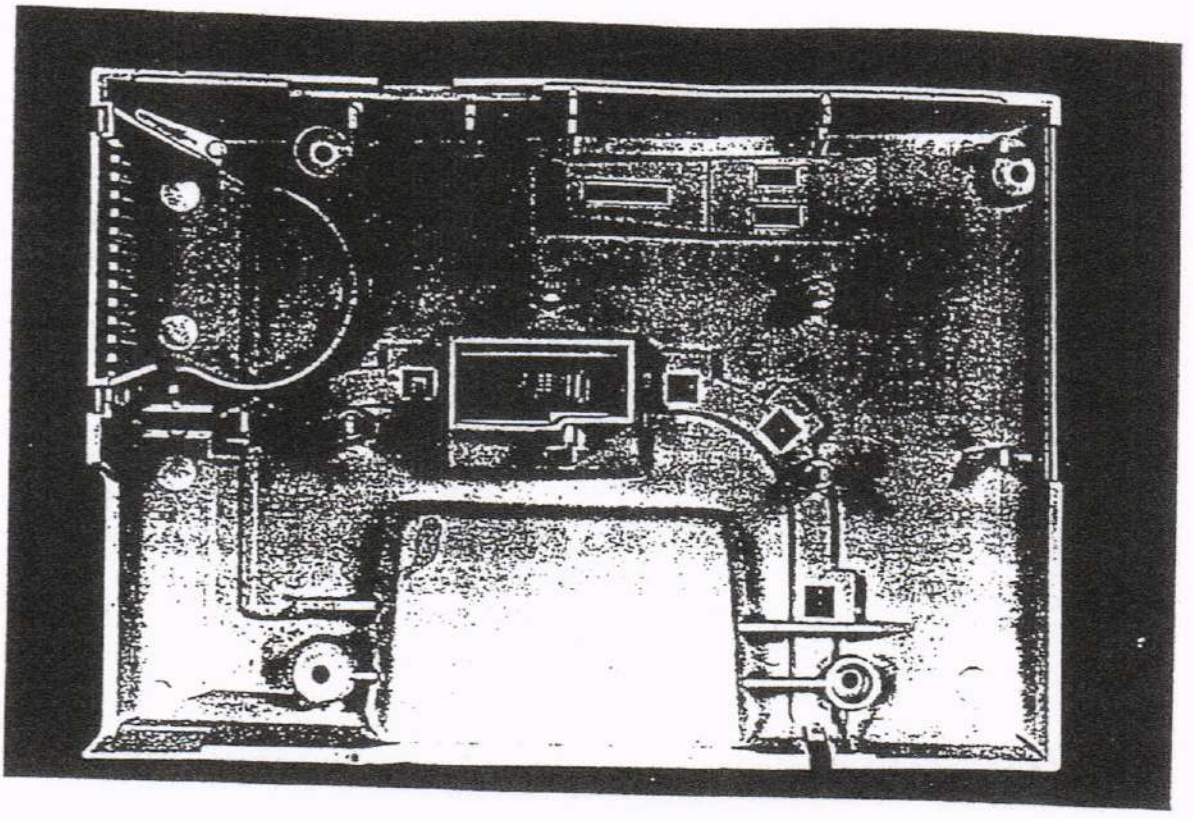

Photo 9. Inside of back part of case showing residue of a brown liquid

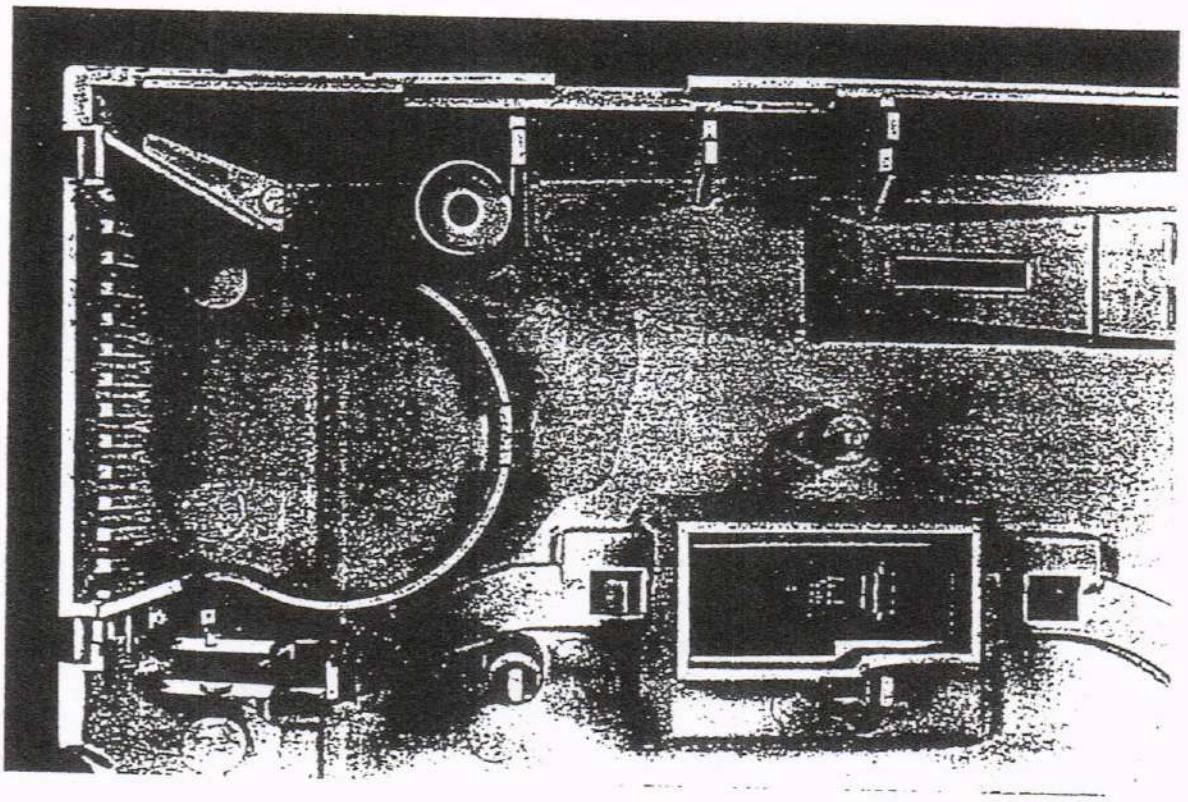

Photo 10. Close-up of the back part of the case in the area of the hookswitch

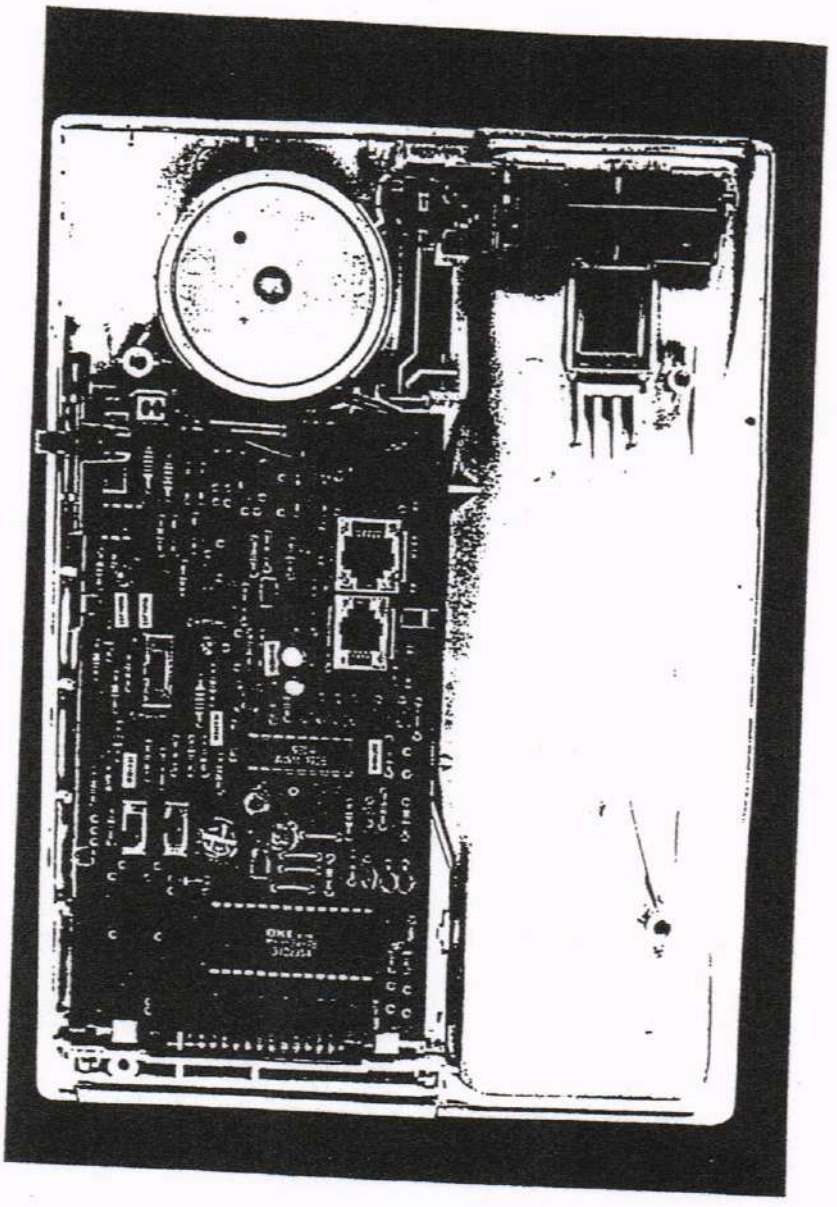

Photo 11. Inside of front part of case showing hookswitch extension and some traces of residue on the case

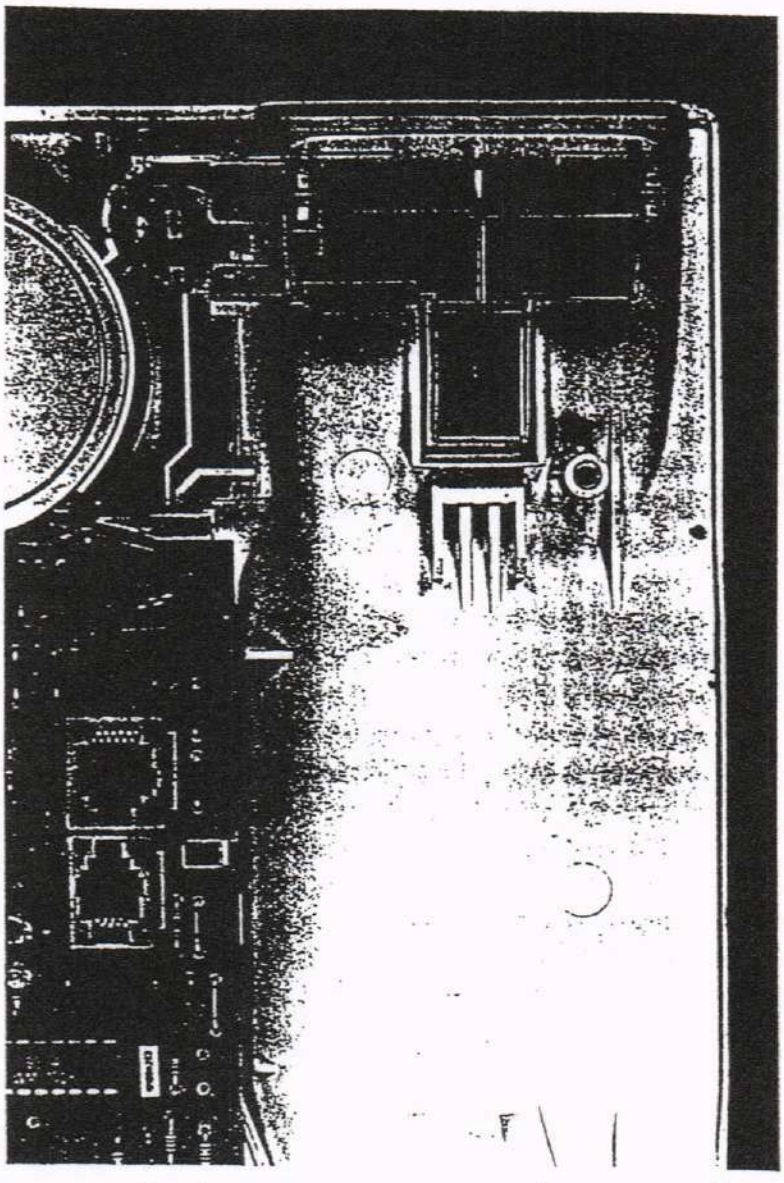

Photo 12. Close-up of the inside of the top case near the hookswitch

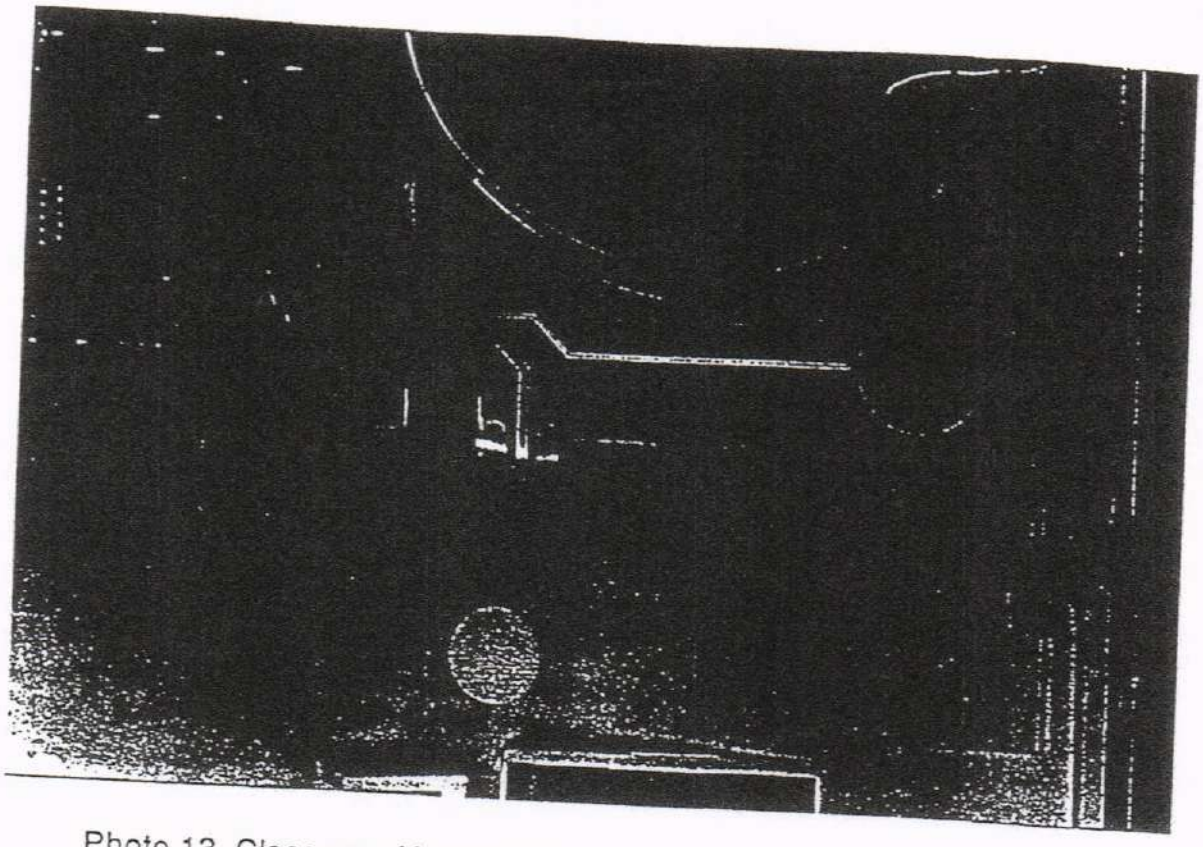

Photo 13. Close-up of inside of top case near hookswitch but with the hookswitch lever removed to show the hookswitch bubble.

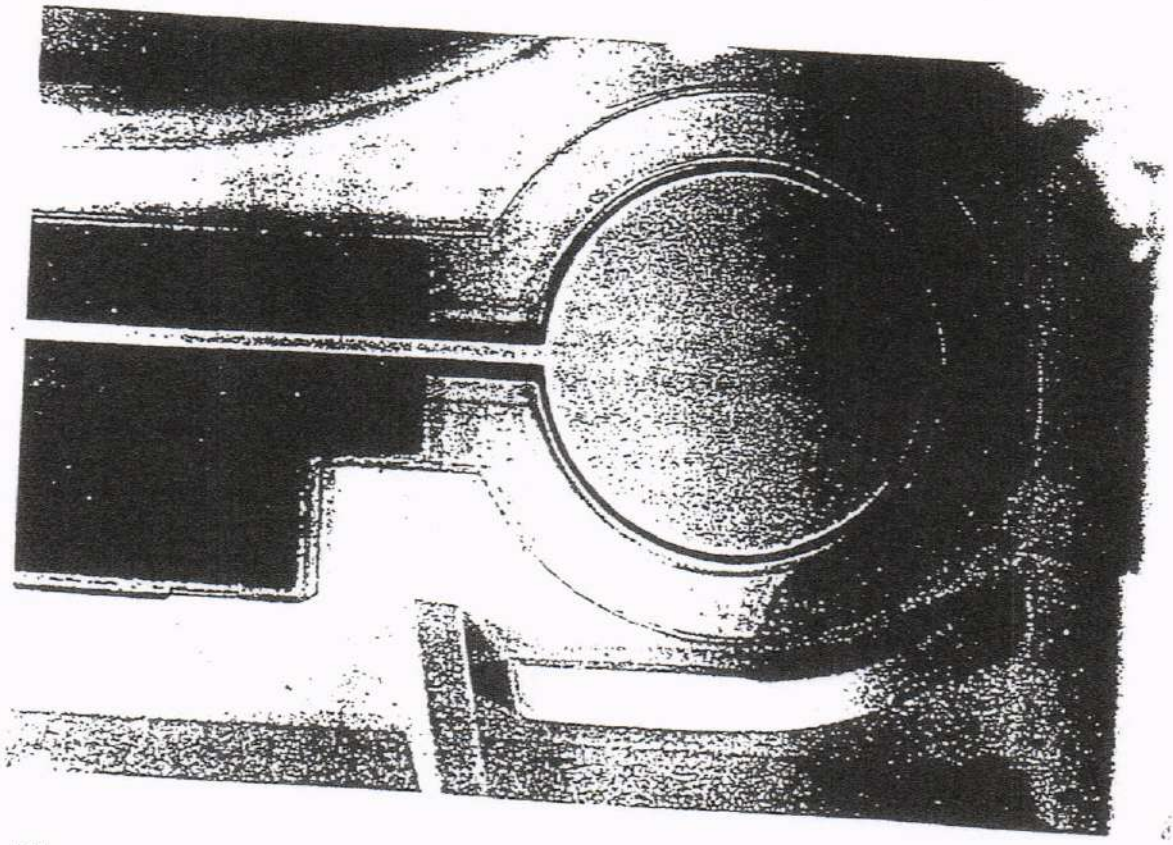

Photo 14. Close-up of the hookswitch bubble showing residue around the top, clear, round section and also under the green area

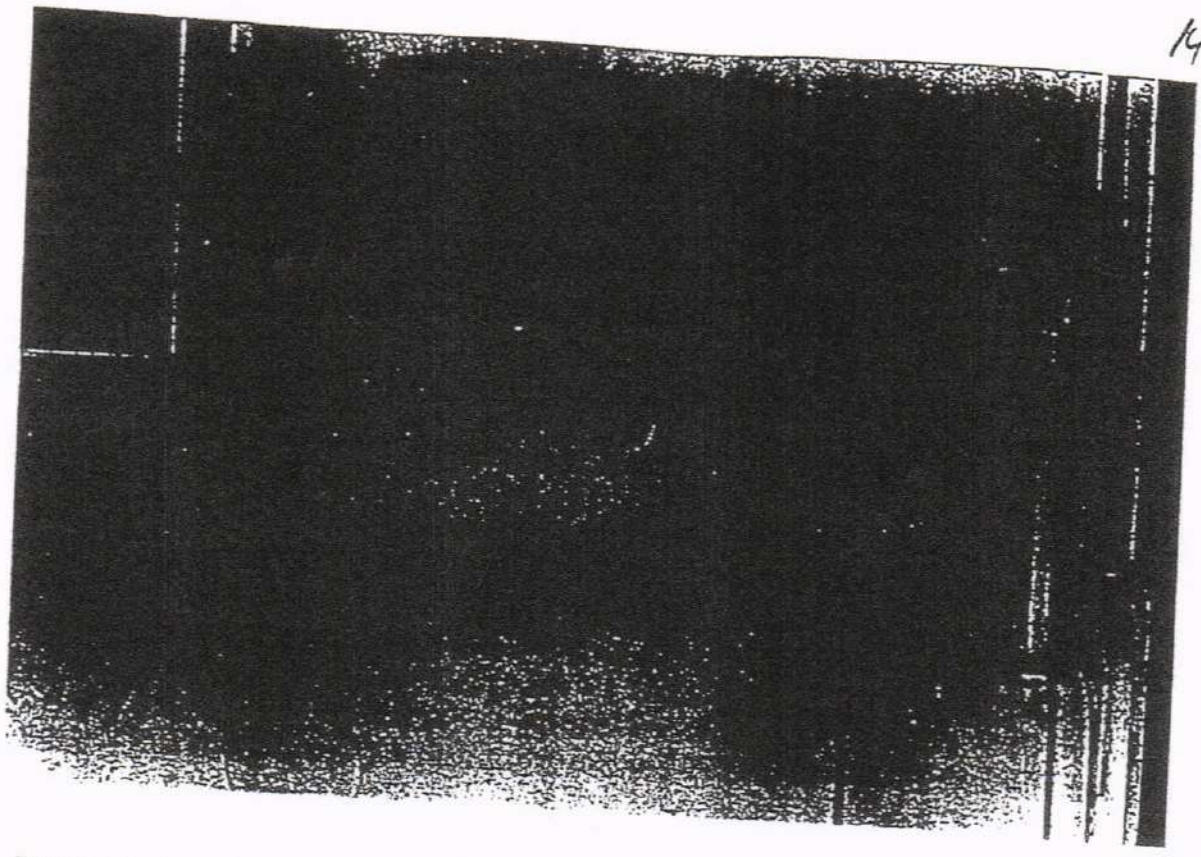

Photo 15. Inside of top case with hookswitch bubble removed showing the brown residue. Also visible is the small bump in the plastic moulding

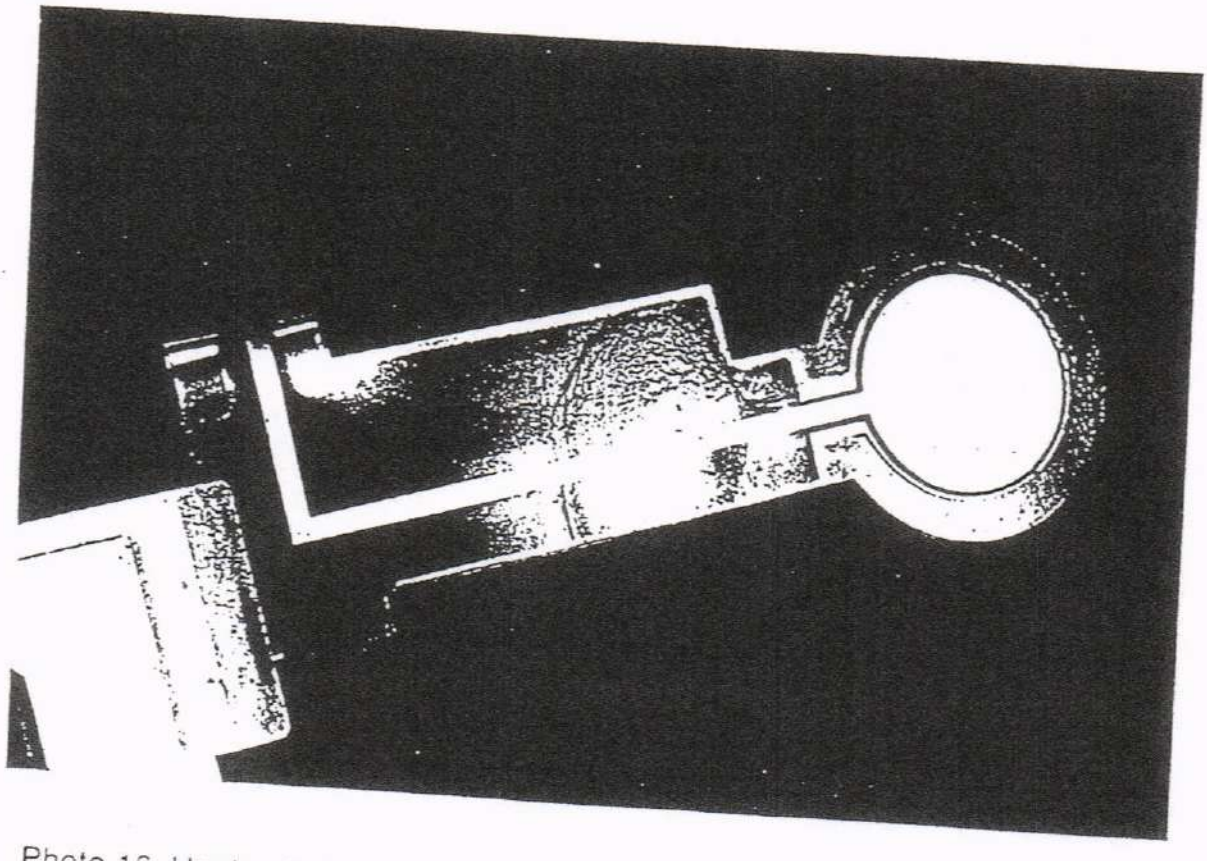

Photo 16. Hookswitch part of the flexible circuit layer showing residue on both the green and clear surfaces

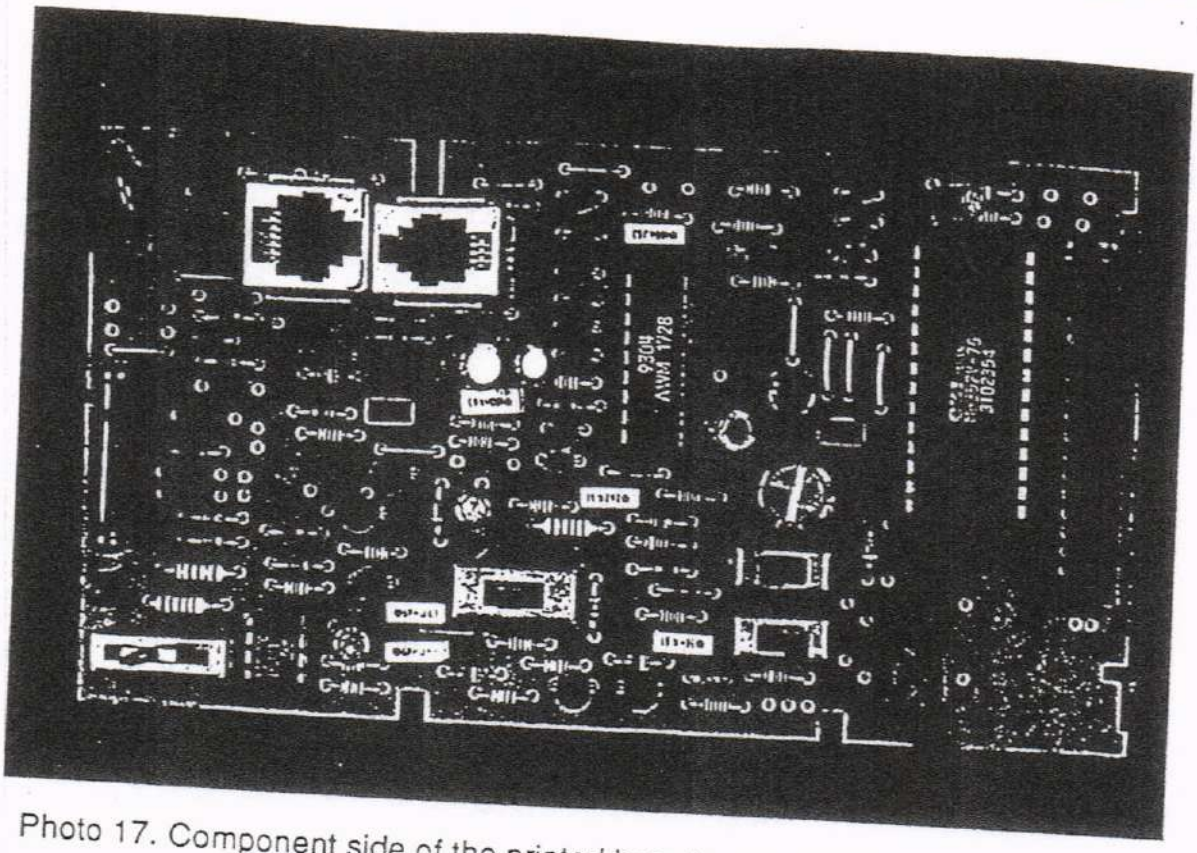

Photo 17. Component side of the printed board assembly showing date code but no evidence of residue

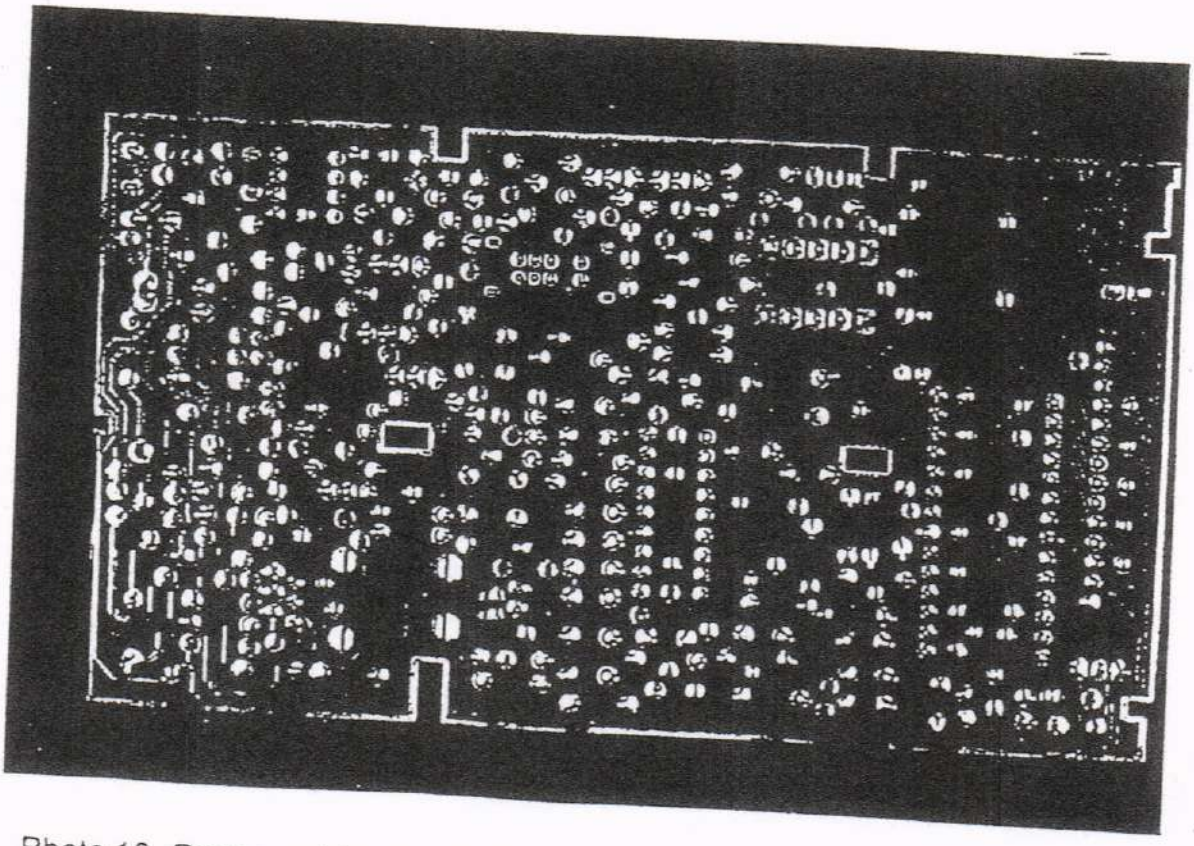

Photo 18. Reverse side of printed board assembly showing manufacturer and revision number but no evidence of residue. (the red colour at the edges is the result of a manufacturing process and is common)

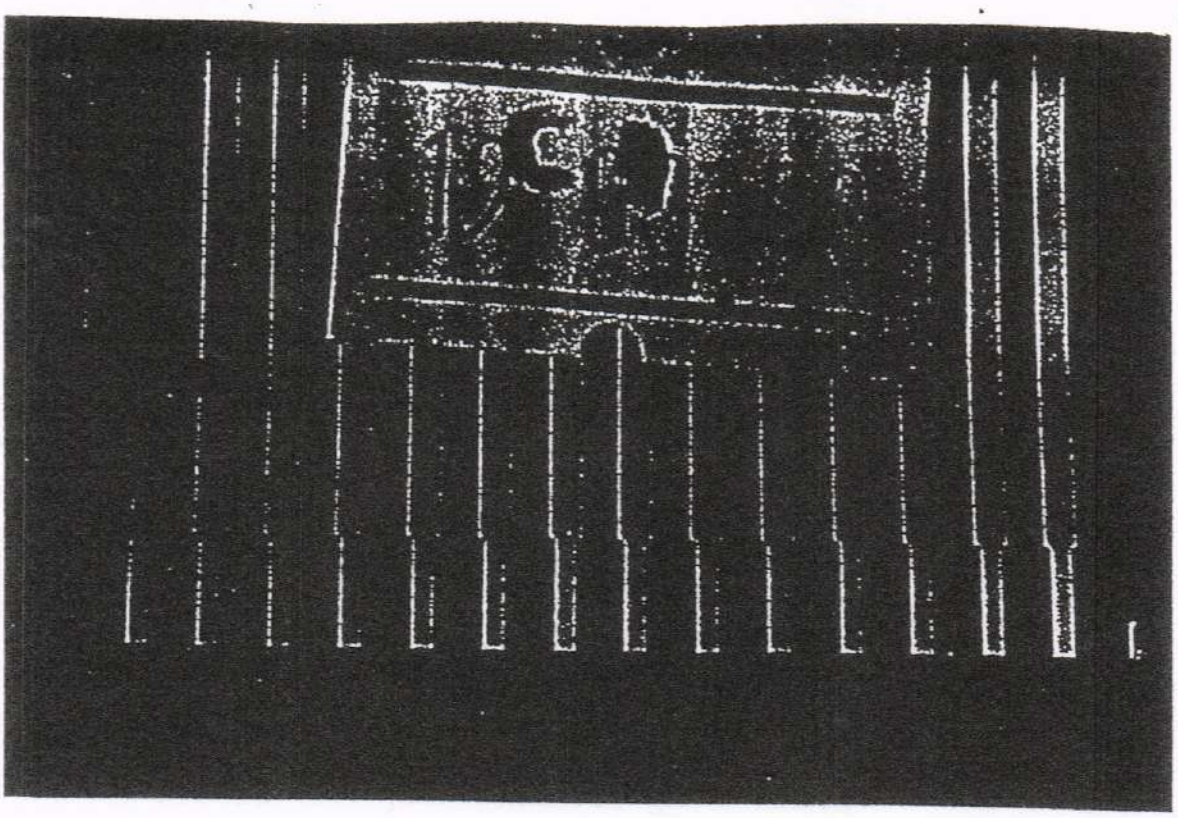

Photo 19. Flexible circuit layer at the edge where it connects to the printed board assembly showing manufacturing date (19/03/93)

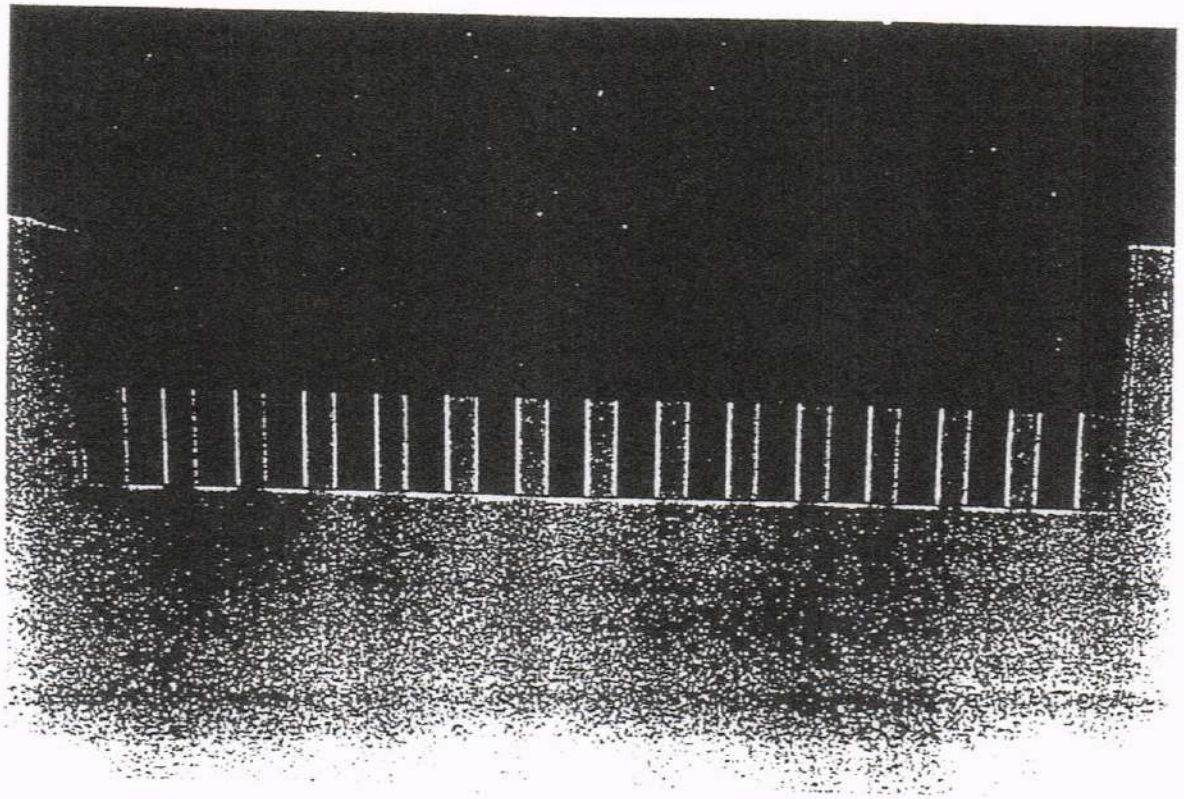

Photo 20. Reverse side of flexible circuit layer at edge connector