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**Also included with this mailing:**

1. CAC Salary Survey
2. Minutes, Special Board of Directors Meeting, May 14, 1987
3. Minutes, Board of Directors Meeting, July 21, 1987
4. Abstracts of papers presented at Fall, 1987, Semi-Annual Seminar

**January 1988**

# CONFERENCES AND SEMINARS

CALIFORNIA ASSOCIATION OF CRIMINALISTS-
70th ANNUAL FALL SEMINAR
October 22-24, 1987

The 70th semi-annual seminar of the CAC will be held at the Irvine Hilton, Irvine CA. For further information contact Eston Schwecke, Huntington Beach Police Department, Criminalistics Laboratory, 2000 Main Street, Huntington Beach CA 92648. (714) 536-5684.

40TH ANNUAL MEETING OF THE AMERICAN ACADEMY OF FORENSIC SCIENCES
February 15-20, 1988.

This conference will be held at the Wyndham Franklin Plaza, Philadelphia, PA. Contact AAFS, 225 South Academy Blvd., Colorado Springs, CO, 80910. (303) 596-6006.

SECOND SYMPOSIUM ON RECENT ADVANCES IN ARSON ANALYSIS AND DETECTION
February 15 - 16, 1988

This symposium will be held in conjunction with the American Academy of Forensic Sciences meeting in Philadelphia, PA. For registration information, contact AAFS, 225 S. Academy Blvd., Colorado Springs, CO 80910 (301)596-6006. Persons interested in presenting a paper during this symposium should contact Mary Lou Fultz, Program Chairman, ATF - National Laboratory Center, 1401 Research Boulevard, Rockville MD 20850 (202)294-0420.

SOUTHERN ASSOCIATION OF FORENSIC SCIENTISTS
May 5-7, 1988

The Spring, 1988, Seminar of the Southern Association of Forensic Scientists will be help at The Peabody--"The South's Grand Hotel"--in Memphis, Tennessee. Anyone interested in attending or in presenting a paper in one of the technical section meetings (Toxicology, Serology, Solid Dosage, Criminalistics, Pathology/Biology, Firearms) should contact Steve Nichols or Paulette Sutton, University of Tennessee--Toxicology Laboratory, 3 North Dunlap, Memphis TN 38163, (901)528-6355.

CALIFORNIA ASSOCIATION OF CRIMINALISTS - 71st SEMI-ANNUAL SEMINAR
May 19-21, 1988

The Spring, 1988, seminar of the California Association of Criminalists will be held May 19-21 at the Marriott Marina Hotel, Berkeley CA. For further information contact Charles Morton. Institute of Forensic Sciences - Criminalistics Laboratory, 2945 Webster Street, Oakland CA 94609. (415) 4512-0767.

SYSTEMATIC ANALYSIS OF LOW EXPLOSIVES
June 13 - 17, 1988

The Bureau of Alcohol, Tobacco and Firearms will conduct a course in the Systematic Analysis of Low Explosives, to be held at the BATF national Laboratory Center in Rockville, MD. For further information, contact Rick Stroebel, ATF National Laboratory Center, 1401 Research Boulevard, Rockville, MD 20850 (202)294- 0420.

41ST ANNUAL MEETING OF THE AMERICAN ACADEMY OF FORENSIC SCIENCES
February 20-25, 1989

This conference will be held at the Riviera Hotel, Los Vegas, NV. Contact AAFS, 225 South Academy Blvd., Colorado Springs, CO, 80910. (303) 596-6006.

INTERNATIONAL SOCIETY FOR FORENSIC HEMOGENETICS
October 18 - 20, 1989

The 13th International Congress of the International Society for Forensic Hemogenetics will be held in New Orleans, LA, from October 18 through 20, 1989. For further information, contact Dr. Herbert Polesky, Memorial Blood Bank Center Minneapolis, 2304 Park Avenue South, Minneapolis MN 55404.

PAN AMERICAN ASSOCIATION OF FORENSIC SCIENCES
November 1989

The Fourth International Meeting of the Pan American Association of Forensic Sciences will be held in Bogota, Columbia. The theme of the meeting is "The Sciences and Justice." For further information, contact Dr. Egon Lichtenberge, Carrera 11 A 96-26, Bogota, Columbia.

# ANNOUNCEMENTS

The Contra Costa County laboratory has new telephone numbers. These number for the main lab is 646-2455 and the number for the laboratory annex (drugs, BA's, instrumental analysis) is 646- 2962.

The award for the outstanding presentation at the Fall CAC Seminar went to Luke Haag for his paper titled "Projectile Induced Mechanical and Thermal Effects in Fibers." Mr. Haag will receive a Certificate of Merit and a $100.00 stipend at the Spring 1988 Seminar in Berkeley.

Nominations for the 1988 Distinguished Member Award must be submitted to the Awards Comittee between January 1 and January 31, 1988. See the announcement enclosed with this newsletter.

# JOB OPENINGS

(Job openings are obtained from a variety of sources. Given publication deadlines and delay in receiving announcements from other parts of the country, some of the openings announced here may be filled by the time this Newsletter is received. Job announcements will normally be run only one time. Members actively seeking employment are encouraged to contact the editorial secretary for information about openings which become available between newsletters. )

CRIMINALIST I

The City of Tucson, Arizona, has openings fro entry-level Criminalist positions. The position requires some experience in the analysis of organic and inorganic materials preferably in a criminalistics laboratory and a BAchelor's Degree in Criminalistics, Chemistry or a natural science. For further information contact Personnel Director, City of Tucson, P.O. Box 27210, Tucson, Arizona 85726.

CRIMINALIST I or II

The City of Huntington Beach is accepting applications for criminalist I or II positions. The Criminalist I position is an entry level position which requires no experience but does require a bachelor's degree in criminalistics, chemistry, biochemistry or a closely related field. The Criminalist II positions requires two years of experience and successful completion of a practical laboratory examination. For further information, contact Personnel Division, City of Huntington Beach, 2000 Main Street, Huntington Beach, CA 92648.

CHEMIST-CRIMINALIST

The Vermont State Police Crime Laboratory is seeking applicants for a chemist-criminalist position. Qualifications include a BS Degree with at least 18 hours of chemistry and a minimum of 4 years experience in a chemistry laboratory or 2 years of experience in a forensic laboratory. For further information, contact Eric Buel, Senior Chemist-Criminalist, Vermont State Police Crime Laboratory, Waterbury VT 05676. (802)244-8786.

# SHORT COURSES

## CALIFORNIA CRIMINALISTICS INSTITUTE (CCI)

By Louis A. Maucieri

[The announcement of the following courses was received too late to be included with the last newsletter, and is included with this newsletter to acquaint CAC members with the activities of CCI, ed.]

The California Criminalistics Institute (CCI) forensic training program opened with a fall kick-off of two courses. Like all offerings from CCI, initial courses are field tested with personnel of the Bureau of Forensic Services (BFS). Repeat classes will be offered to the forensic staff of other laboratories in California after evaluation of initial efforts. CCI programs in California will complement the fine work done on a national level by the FBI Forensic REsearch and TRaining Center in Quantico, Virginia.

The first CCI class as "Safe Handling and Shooting of Firearms" held during mid-October 1987, for crime laboratory and latent fingerprint staff. These personnel routinely encounter weapons in a crime scene situation or receive and examine them in a laboratory setting. Because Firearms are sometimes loaded or found with "safeties" in various positions, lab personnel need to learn proper handling and firing procedures. Fourteen students were in attendance at the classroom and range facility of the Department of Forestry in Ione, California. The course was taught by consultant Bruce Nelson, and criminalists Dave Barber and John Hamman of the Bureau of Forensic Services field laboratories.

The second course, "Forensic Academy--Orientation", began November 2, 1987 in Sacramento. This three-week class has application for all personnel newly assigned to a forensic laboratory. The first week combines general information on state employment, benefits, and the history operation, and structure of BFS. Case prioritization, training sources, forensic program overviews and tours are included. The first week was attended by criminalists, lab technicians, toxicologists, clerical and latent print examiner.

After a three-week intermission, the second phase of the class continues with more in-depth overview technical training. This concludes with a court testimony exercise in an evening session. On the last day students review videotapes of this exercise. This class started with seventeen students and has forty instructors.

## MAFS Spring Workshops

"Microscopical Identification of Explosives" - March 14-18, 1988

This course will be held at Missouri Western College, St. Joseph Missouri. For further information, contact James Crippin, Missouri State Patrol Crime Laboratory, St. Jospeh MO 64506. (816)233-0291.

"Archeology, Anthropology and Odontology of Burial Sites"

"ATF Arson Detection Course" - May 2-6, 1988

These courses will be held at Madison, Wisconsin. For additional information, contact Michael A. Haas, Crime Laboratory Bureau- Madison, 4706 University Avenue, Madison WI 53705. (608)266-2031.

# THE MEASUREMENT OF BULLET DEFLECTION BY INTERVENING OBJECTS AND THE STUDY OF BULLET BEHAVIOR AFTER IMPACT

***Lucien C. Haag***

*Forensic Science Services, Inc.*
*4034 W. Luke Avenue*
*Phoenix AZ 85019*

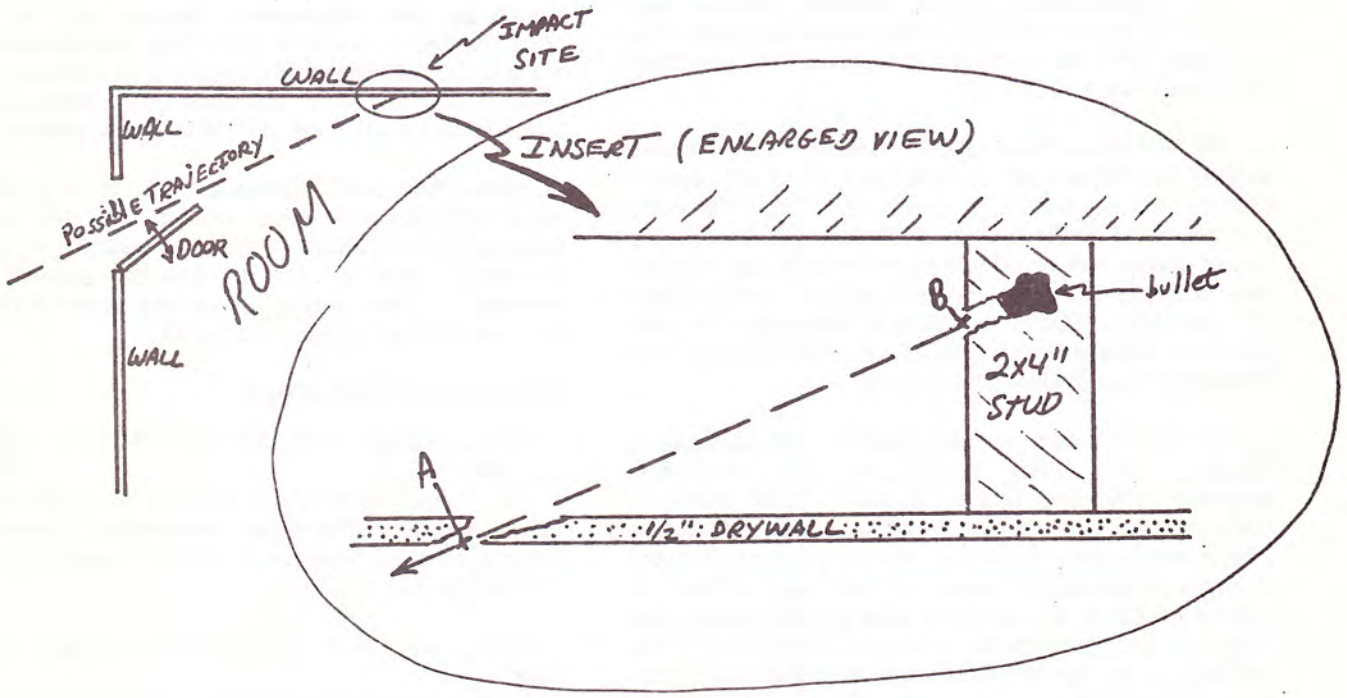
Introduction

In the examination of shooting scenes it is not uncommon to encounter situations where a projectile has struck or passed through one or more objects before coming to rest at some downrange point. In attempting to reconstruct such scenes it is often important to know whether the projectile was deflected by such intervening objects and, if so, the degree of such deflection. This paper will describe two methods of measuring bullet deflection and studying bullet behavior after impact. Case examples of the application of these techniques will also be presented.

Short range situations

Cases of this type involve post-impact terminal ballistic trajectories measured in inches to a few feet. Figure I depicts a plan view of such a case where a bullet has passed through an open doorway from outside to inside, traversed a portion of the room then passed through the 1/2 inch drywall material before embedding itself in a 2x4" wall stud. The question to be addressed is whether the bullet's flight path was altered by passage through the drywall (i.e.- is the retrograde extrapolation of points A and B truly representative of the bullet's pre-impact flight path?).

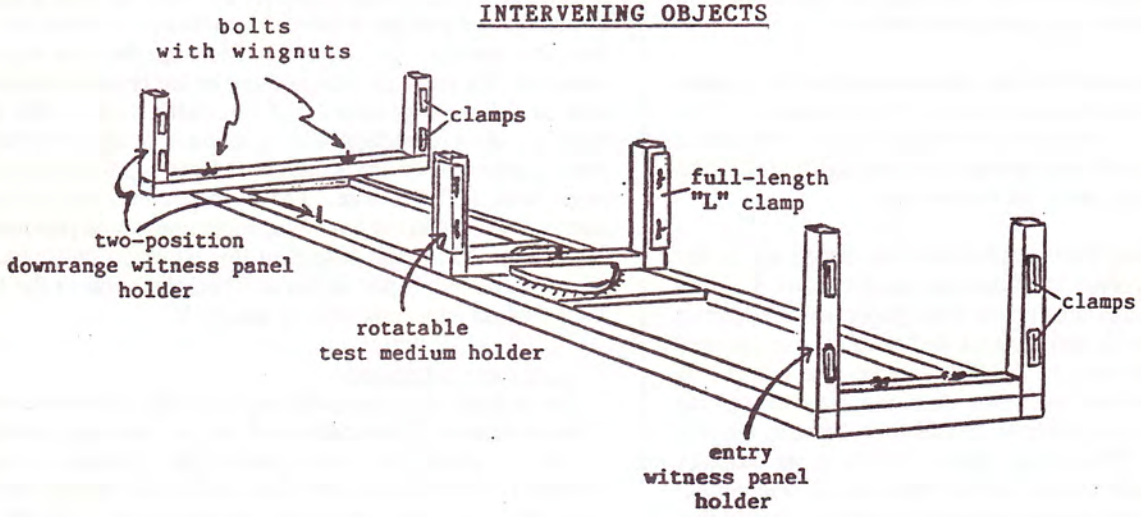
Figure I



For such short range determination a special device was constructed with two views of which are shown in Figure IIA and Figure IIB

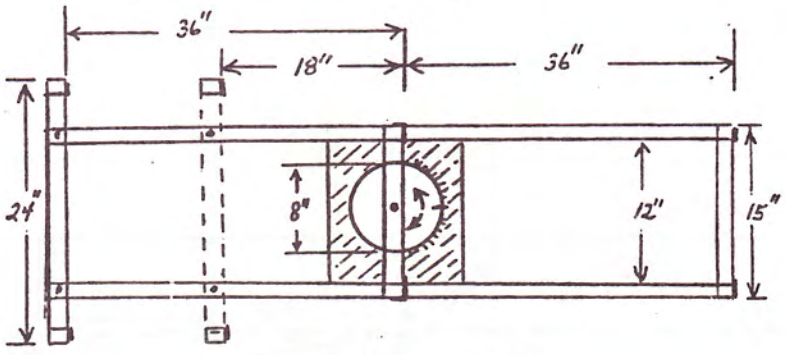
## Figure IIA

DEVICE FOR MEASURING PROJECTILE DEFLECTION
BY
INTERVENING OBJECTS




## Figure IIB

PLAN VIEW




[2x2" boards for framework]

Note: All permanent unions are made with wood screws and epoxy cement.

The center framework of this device is mounted on a rotatable palate with degree marks so that the test material (drywall, glass, wood paneling, sheet metal, etc.) can be positioned at selected angles to the bullet's trajectory. Full length metal "L" Clamps mounted on bolts and wingnuts are used to secure the test material to the rotatable holder. Pre-impact and post- impact holders are mounted with bolts and wingnuts at each end of the device and are equipped with simple paper clasps to hold panels of common 0.005" thick white b utcher paper. These paper screens serve as witness panels for the bullet's flight and for determining the post-discharge trigonometric relationships necessary to carry out the various computations of interest.

It should be noted that the downrange holder is extra wide and can be positioned at either of two locations. The forward position is employed for initial firings with bullets and /or test materials anticipated to have highly deflectibe properties or a high potential for breakup.

Two means have been employed in the actual use of this device. One involves multiple firings (typically 3 shots) through the uprange and downrange paper witness panels with no test material being struck and with the gun secured in a machine rest such as the Culver Zero-One device. If the gun and machine rest have been properly set up and secured, a single, ragged hole should be present in the two witness panels. These two points represent the normal, uninterrupted flight path of bullets fired through the deflection device. The test medium is now lowered or rotated into the desired position and another shot is fired. Bullet entry into the same hole in the uprange panel verifies that nothing has shifted during the introduction of the test material. Any deflection of the bullet will be apparent in the downrange panel by the presence of a displaced bullet hole. The direction and magnitude of any deflection caused by the intervening object simple involves taking the measurements depicted in Figure III and calculating the angle from the arc tangent of d/1

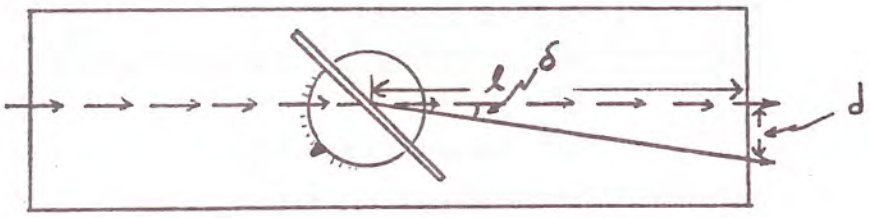
Repeat firings and measurements can be carried out with the same panels and test medium (as long as it is not frangible) simply by sliding the test material upwards a sufficient distance to present a new, undamaged area to the subsequent shot.

An alternative approach involves the use of a small laser (such as described by the author in a previous paper) and does not require pre-impact test shots or the use of a machine rest. The test material however must be such that it will survive the shot and have a discrete bullet hole in it. If this latter requirement cannnot be met, the then a paper witness paper can be secured immediately in front of the frangible test material. After the discharge the laser is positioned so that its beam passes thought the pre-impact bullet hole in the uprange panel and the bullet hole in the test material. Any deflection will be evident on the downrange witness panel when the location of laser light spot is compared with the bulet hole. The measurements and calculations would be carried out in the some manner as previously described. Additional firings in this situation only require shooting through a previously unstruck location in the forward witness panel and the test material.

Long range situations

These cases involve questions of bullet deflection over distance measured in hundreds of feet or yards and generally arise in alleged accidental shootings. Claims of bullet ricochet from the ground or water, deflection by intervening twigs, branches, tall grass, etc. deserve to be evaluated in most of these cases. To do this an expanded modification of the multiple paper witness panels can be used along with a sturdy firing platform and machine rest for discharging the gun and ammunition in question. Target-type frameworks with paper* witness panels are positioned at appropriate intervals downrange such as 10 or 20 yards apart. Multiple shots with no intervening test object or material allow the normal flight path of the bullets to be established when the machine rest is able to return the gun to the same position if this cannot be done to the examiner's satisfaction, the port-

Figure III



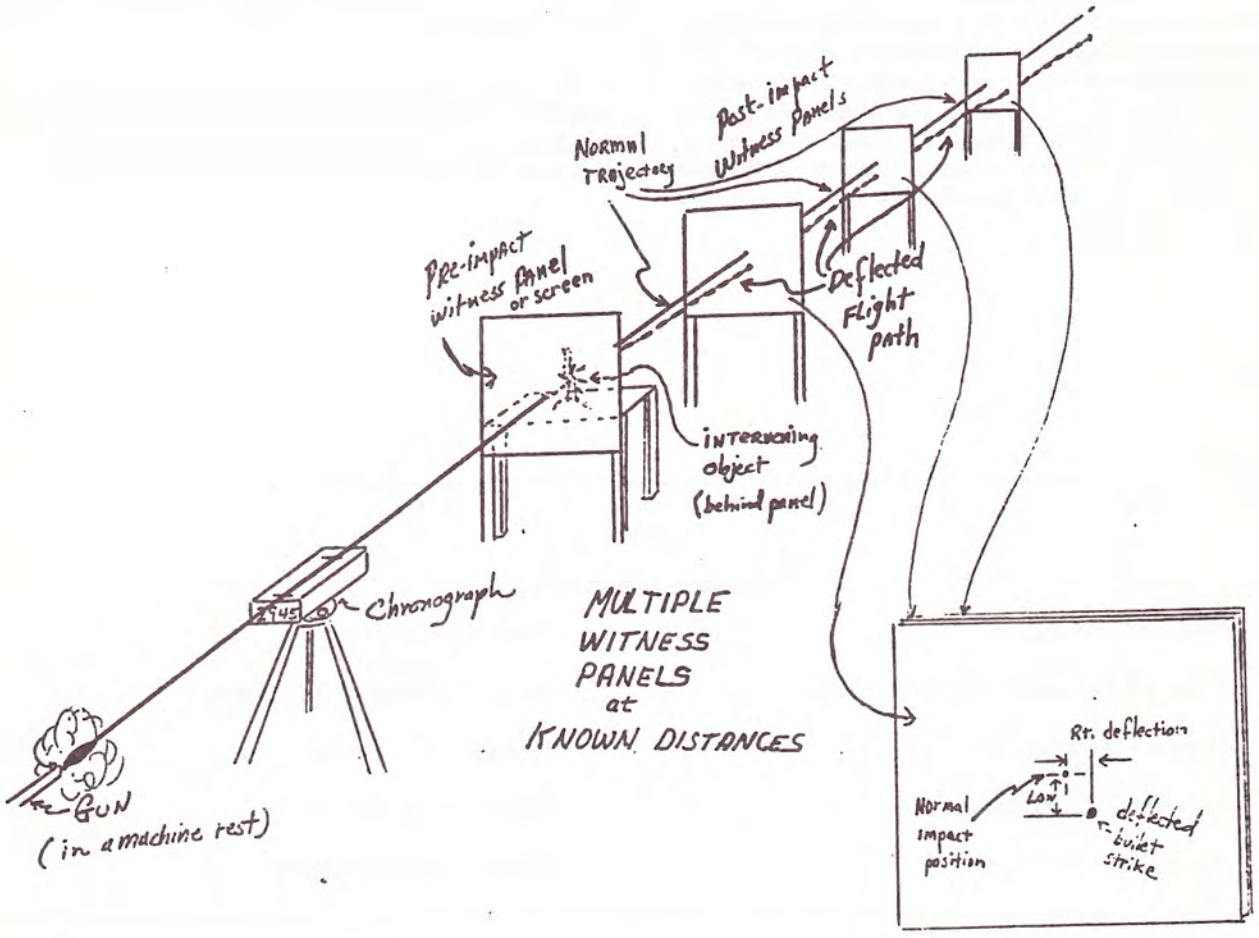

$$\tan \delta = \frac{d}{l}$$

able laser technique will be necessary along with the use of 2 adequately spaced pre-impact witness panels. If chronographic measurements are deemed desirable, it can be placed in a suitable location as shown in Figure IV on the following page. It should also be pointed out that if there is any concern that the paper panels themselves may be contributing some influence on the bullet's behavior, one need only paper, the last framework, fire multiple shots from the machine rest to produce a tight grouping then paper the other panels and re-fire the gun several times. A comparison of these strikes on the last witness panel with the previous ones should answer this question.

foration of 5.16" thick cedar boards used for fencing around a patio.

The use of multiple downrange witness panels spaced at known distances not only allows the direction and magnitude of any deflection to be calculated but also permits the post-impact behavior of the bullet to be studied. This is done by making a single, composite diagram from the multiple downrange witness panels. Four (4) of these composite diagrams are included at the end of this paper to illustrate the technique as well as the interesting behavior of the destabilized bullets. Each diagram provides three views of the same shot: A down-range view a profile (or side

Figure IV




This procedure illustrated in Figure IV has been successfully employed by the author in two fatal shooting cases where 5.56mm (223Rem.) ammunition was involved. In one of these cases the deflective and destabilizing effects of small hard-wood branches ranging from 1/8" to 3/4" in diameter were evaluated. The second case involved ascertaining the magnitude of any deflection caused by the per-

view) along the horizontal plane and a plan (or aerial) view. Using this technique along with the numerous firings of the evidence ammunition and gun, reasonable limits could be set for the maximum degree of deflection that could be induced by impact with such intervening objects. Table I summarizes the results for 25 shots with a Ruger Mini-14 5.56mm rifle (6-R with a 1 in 10" twist)firing Remington factory ammunition loaded with a 55GR JSP bullet. The

average velocity 15' beyond the muzzle was 2991=/-15f/s (N=16). Each of these shots struck a single hardwood branch of 0.4" to 0.8" diameter located approximately 30' beyond the muzzle.

The energy and velocity loss experienced by such deflected bullets could also be measured by means of pre- and post- impact chronography. The velocity loss suffered by a 55 GR JSP bullet perforating a 0.5" hardwood branch was found to be 103f/s and in the case of a 55GR bullet perforating a 7/16" thick cedar board and ammunition combination, velocity losses of 45 and 79f/s were realized.

The downrange witness panels also provide a means of assesing the amount of bullet deformation (if any) by virtue of its signature or outline in the panels (see the composite panels at the end of this paper).

In addition to the two cases mentioned above, some initial evaluation of other bullet and test material combinations have been undertaken which have led to several interesting observations deserving of a more formalized approach. The most noteworthy observation is that bullet deflection does not always deviate in the direction one might expect. For example, in Figure III the dashed arrows represents the unaltered flight path of the projectile and the solid line deflected flight path after impact with a surface at approximately 45 degrees obliquity to the bullet's normal trajectory. The direction of the deflection shown in this illustration is as one might expect intuitively. With some projectile/intervening material combinations however, there was a reversal in the direction of deflection which was very consistent shot after shot (e.g. - low velocity, small caliber projectiles through 1/2" drywall at angles of obliquity of 30degrees to 60degrees). In other instances, the destabilized bullets (as evidenced with multiple downrange witness panels) seemed to be spiraling around what would have been their normal flight path (see composite #4).

Conclusion

The device shown in Figure IIA and IIB and the technique described in this paper can be used to carry out an empirical evaluation of the deflective characteristics of a specific gun- ammunition-intervening material combination. The post impact behavior or the projectile can be studied and illustrated by preparing composite diagrams from multiple downrange witness panels.

A more rigorous evaluation of the physics and mechanics of bullet deflection would be most welcomed. It is hoped that the work presently underway on this subject at U.S. Berkeley will soon be completed and published.

**Table I**

**[25 Deflected Shots]**

| Horizontal Deflection | Vertical Deflection |
|---|---|
| Mean = 0.24degrees +/-0.17 degr.(LSD) | Mean + 0.24degr +/-0.18degr(lsd) |
| Highest = 0.50 degrees | Highest = 0.60 degrees |
| Lowest = 0.00 degrees | Lowest = 0.01 degrees |
| Mean +3sd = 0.75 degrees | Mean + 3sd = 0.78 degrees |

## COMPOSITE I

5.56mm-55GR Rem. JSP

Ruger Mini-14

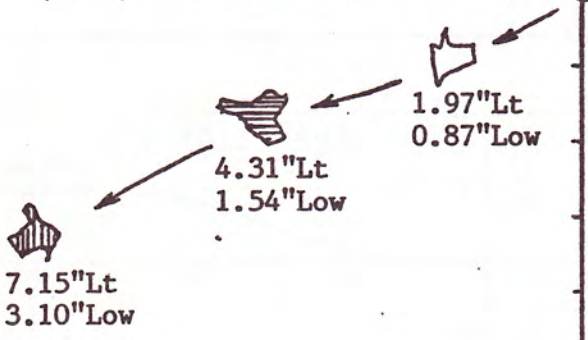
Direct hit on a 0.6" diameter hardwood branch ca. 30' distance

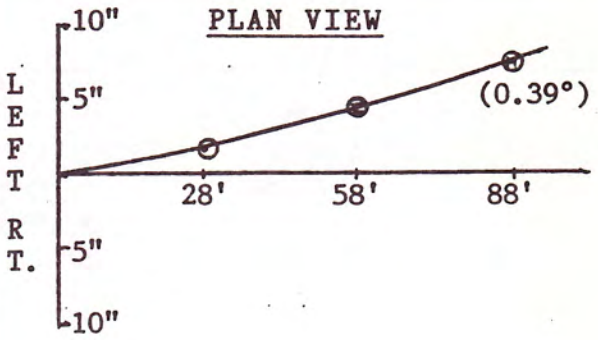
Distance after Impact

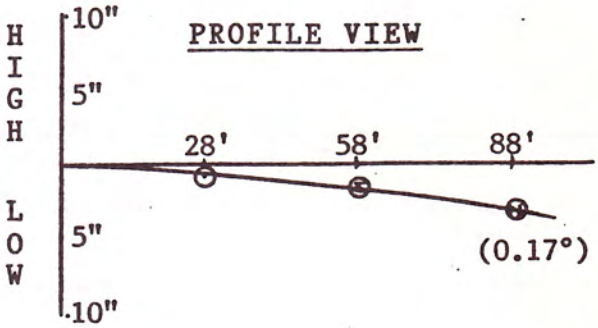
○ = 28ft.

▨ = 58ft.

▨ = 88ft.




scale: Each major division = 1 inch

COMPOSITE II

5.56mm-55GR Rem. JSP

Ruger Mini-14

Shallow right graze
(0.05" deep x 0.4" long)
in a 0.6" diameter branch

Distance after Impact

○ = 28ft.

● = 58ft.

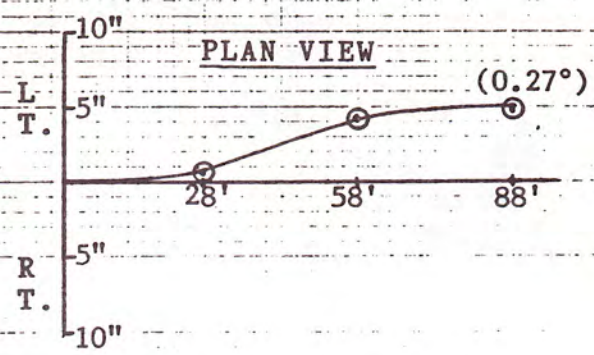
● = 88ft.

5.0"Lt
1.0"High

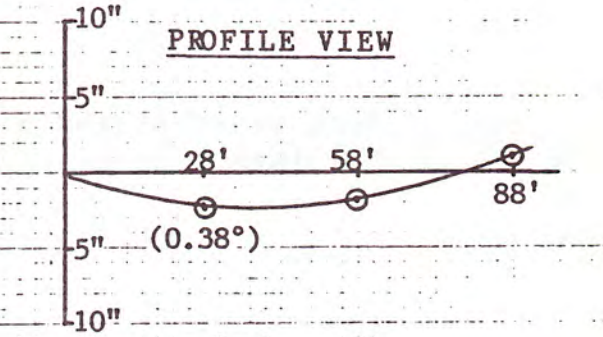
4.2"Lt
1.7"Low

0.72"Lt
2.2"Low

PLAN VIEW




PROFILE VIEW



## COMPOSITE III

5.56mm-55GR Rem. JSP

Ruger Mini-14

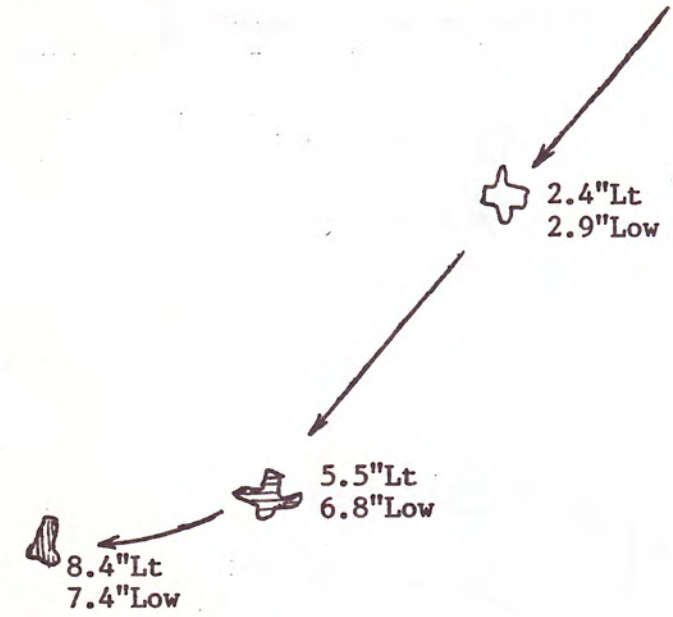
Deep left graze (0.7" long) on a 0.8" diameter branch

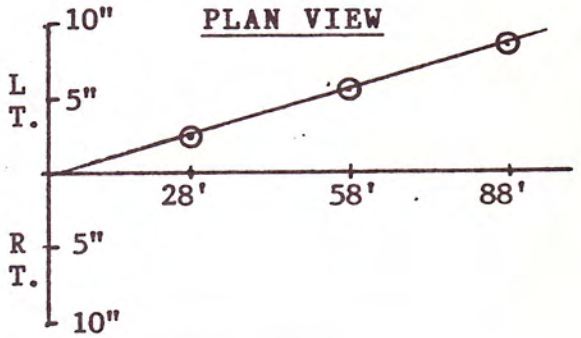
Distance after Impact

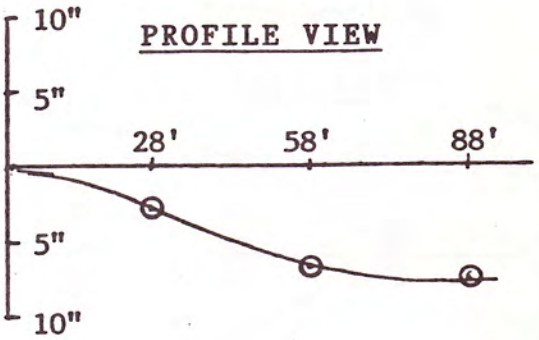
○ = 28ft.

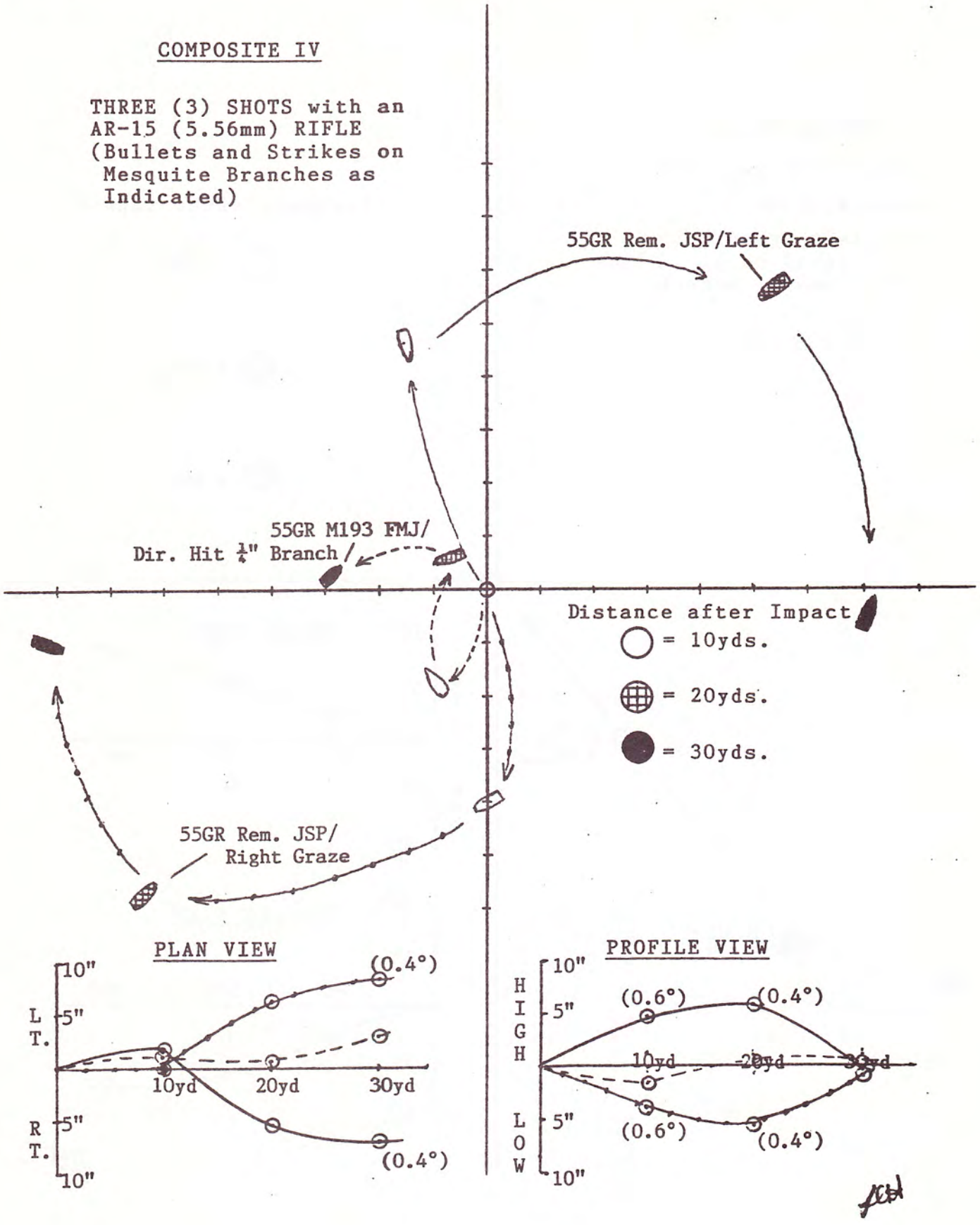
= 58ft.

= 88ft.




COMPOSITE IV
THREE (3) SHOTS with an AR-15 (5.56mm) RIFLE (Bullets and Strikes on Mesquite Branches as Indicated)
55GR Rem. JSP/Left Graze
55GR M193 FMJ/
Dir. Hit ¼" Branch
Distance after Impact
= 10yds.
= 20yds.
= 30yds.
55GR Rem. JSP/
Right Graze
PLAN VIEW
10"
5"
LT.
5"
RT.
10"
10yd
20yd
30yd
(0.4°)
(0.4°)
PROFILE VIEW
10"
HIGH
5"
(0.6°)
(0.4°)
10yd
20yd
30yd
LOW
5"
(0.6°)
(0.4°)
10"

# A MODIFIED DRIFTS TECHNIQUE APPLIED to FORENSIC ANALYSIS of PAINTS and DRUGS

***Lansing Lee***

*Oakland Police Department*
*Criminalistics Section -- Room 608*
*455 7th Street*
*Oakland CA 94607*

***Fred Walder & Sofia Bijaslewicz***

*Nicolet Instrument Company*
*215 Fourier Avenue*
*Fremont CA 94539*

With the advent of FTIR and a variety of available accessories, infrared spectroscopic analyses have become easier on a great number, of samples. The FTIR advantages of high energy throughout, speed, ability for multiple scans. high resolution, data base searches, and computer spectral manipulations are well documented.

Accessories are plentiful. Among them, one finds microscopes, beam condensers. attenuated total reflectance, circle cells, diamond cells. And also, one finds the usual assortment of hyphenated techniques such as GC-FTIR, and TLC- FTIR.

The focus of this note is on a modified case technique that I have tried and believe shows some promise of usefulness. DRIFTS is short for Diffuse reflectance infrared fourier transform spectroscopy. Griffiths and Fuller did a lot of the early work in the late 1970's. Among the forensic community, Suzuki and Gresham from the Washington State Crime Laboratory in Seattle published two articles in the Journal of Forensic Sciences in 1986 dealing with a variety of samples. Suzuki's "DRIFTS I" paper gives a very clear and understandable description of the theory behind DRIFTS. So I will refer to his article to cover the theoretical concepts of DRIFTS.

The paper that really interested me in DRIFTS , however, was Spragg's use of sandpaper on a plastic molding sample as a means of sample preparation and as sample holder to be placed in the DRIFTS apparatus.

In Crime, one looks for motive and opportunity. In this instance the need was substituted for motive. The need in this case was a collaborative testing service proficiency sample 87-4 involving the house paint" samples. After examination by polarized light microscopy, items A and C were readily differentiated. However, Item B was not readily differentiated from Item A. (Although some slight indications were observed).

The opportunity to use an FTIR then presented itself along with a variety of accessories in the form of instrument evaluations. FTIR was able to differentiate all three paint samples. But what was most interesting was the use of DRIfTs with sandpaper, which led to this presentation.

The technique of sandpaper preparation for DRIfTS Requires an FTIR, a DRIFTS accessory (see vendor exhibits) and some silicon carbide sandpaper, available at your local hardware store. Grit size varies according to sample, which will be discussed later.

Figure A shows the comparison of CTS paints A, B and C by microreflectance.

Figure B shows the comparison of CTS paints A, B & C by DRIFTS sandpaper.

One can quickly see from the slides that, although sample A is similar to sample C, sample A is clearly different from sample B. Likewise, sample B is different from sample C. A is similar to C and dissimilar to B at 3700 $cm^{-1}$. A is similar to B and dissimilar to C at 1900 $cm^{-1}$. All samples are different at 1000 $cm^{-1}$, but are the bands real?

In evaluating the technique one has to consider several factors. One has to look at the quality of the spectra, reproducibility, ease of use, sample size needed for optimum results, and usefulness of the technique as compared to others.

Automotive Paint Reference Collection PA81A0044 was used to evaluate the sandpaper sampling technique and the DRIFTS method.

Figure C shows the standard paint in a normal transmitted KBr pellet. Figure D shows the same paint in a diamond cell mounted on a microscope. Figure E shows the paint run normally by DRIFTS and Figure F shows the paint by DRIFTS on sandpaper.

As one can see from these spectra, the various techniques give very comparable results. The choice is dependent on what is available in the lab, and which techniques are easiest or most advantageous.

Sensitivity of the technique is good. Less than 0.1 mg of sample was needed to obtain the spectra in the various slides using DRIFTS sandpaper. With careful sample han-

dling and positioning of the sandpaper in the light path even higher sensitivities should be possible. A minimum sample size on the order of 20 or so micrograms seems to achieve results.

The real usefulness is with paint samples that have multiple layers. One could sand away one layer at a time for drifts-sandpaper analysis. Also, one could save a lot of time generating an automobile paint data base from the automotive paint collection.

This is only a preliminary work-up and more work is necessary to fully utilize the technique and to optimize spectra. Other considerations to be investigated include:

1. Grit size of sandpaper: The optimum grit sized seems to be around 220 grit. However, the coarser grits tend to require more and larger samples for manipulation. So in some cases a finer grit is necessary for manipulative considerations and this will still give useful spectra.

2. The effects of brands of sandpaper to see if the various binders have any effect

3. The optimum loading of the sample on the sandpaper

4. The reproducibility of the technique

5. Whether or not all of the finer absorption bands are real or artifacts of the technique.

I have also utilized this technique to examine drugs. In Oakland "rock" cocaine is about 70% or our caseload. Fortunately, most "rocks" are relatively pure, and good spectra can be obtained very quickly with this technique.

The bottom line is this: The technique seems to work well. It is certainly quick and easy. And the spectral information is comparable to other FTIR techniques. The extent of this utility is up to the users' imagination.

Acknowledgment and thanks for assistance and use of their instruments to Sophia Bijasiewicz and Fred Walder of Nicolet Instruments and also to Hue Phan, Jerold Kacsir and Al Lipper of Analect Instruments.

References

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Suzuki, E.M. and Gresham, W.R., "Forensic Science Applications of Diffuse Reflectance Infrared Fourier Transform Spectroscopy (DRIFTS): I. Principles, Sampling Methods, and Advantages", *Journal of Forensic Sciences* Vol. 3', 3 July 1986, pp931-952.

Suzuki, E.M. and Gresham, W.R., "Forensic Science Applications of Diffuse Reflectance Infrared Fourier Transform Spectroscopy (DRIFTS): Direct Analysis of Some Tablets, Capsule Powders, and Powders", *Journal of Forensic Sciences* Vol. 31, 4 October 1986, pp 1292-1313.

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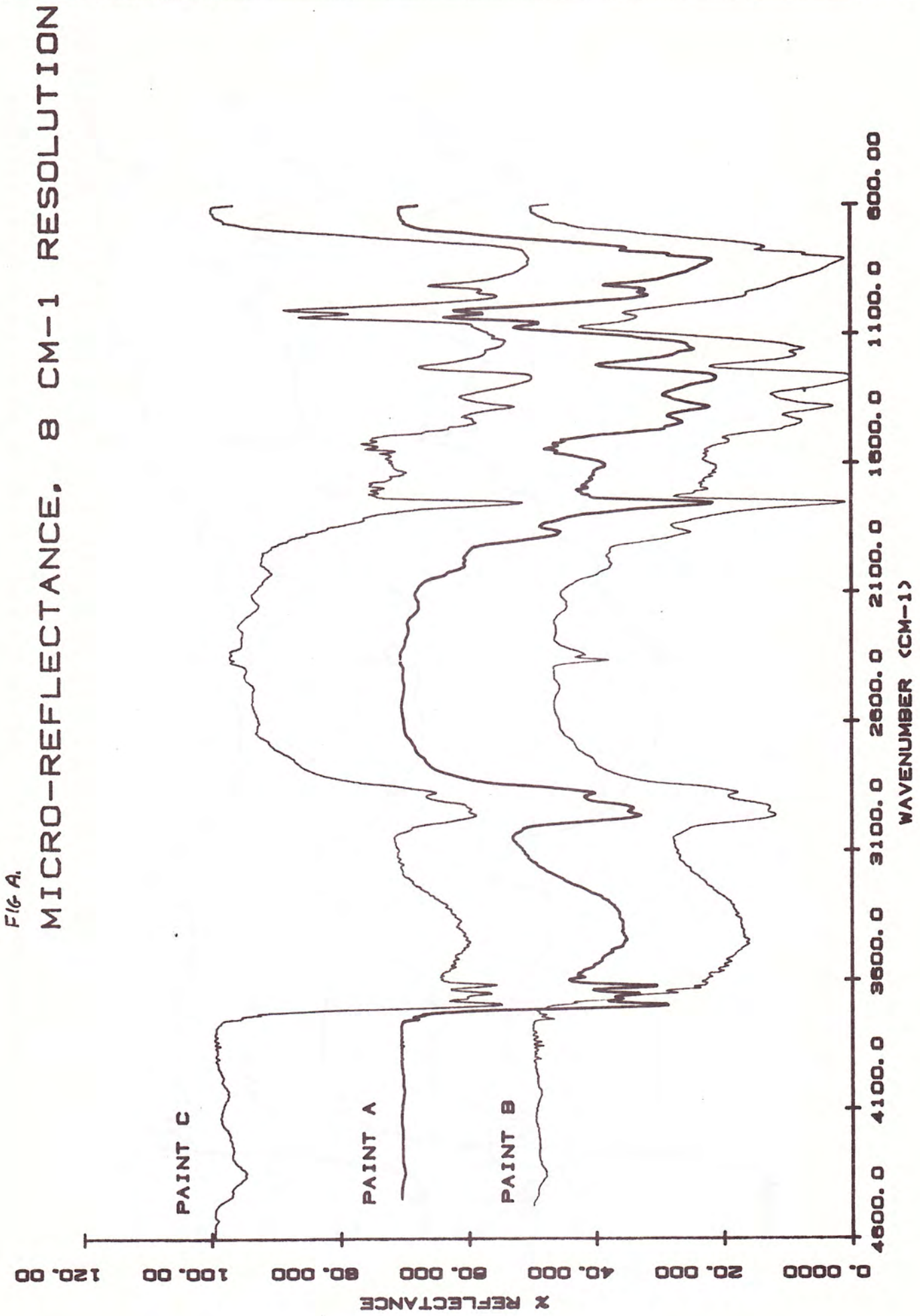
Fig A.

MICRO-REFLECTANCE, 8 CM-1 RESOLUTION



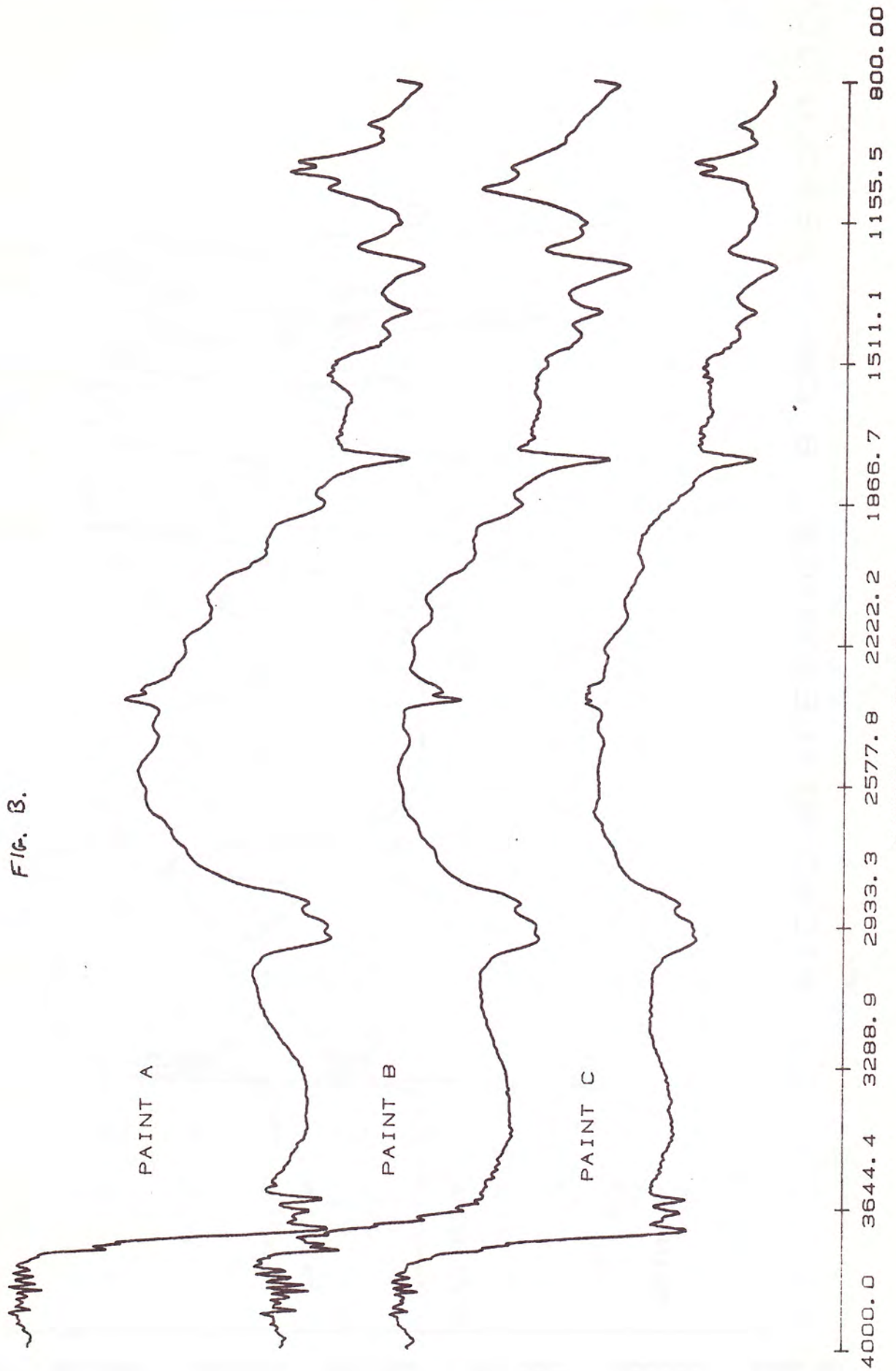

PAINT A
PAINT B
PAINT C
4000.0
3644.4
3288.9
2933.3
2577.8
2222.2
1866.7
1511.1
1155.5
800.00
WAVENUMBER (CM-1)

FIG. 3.

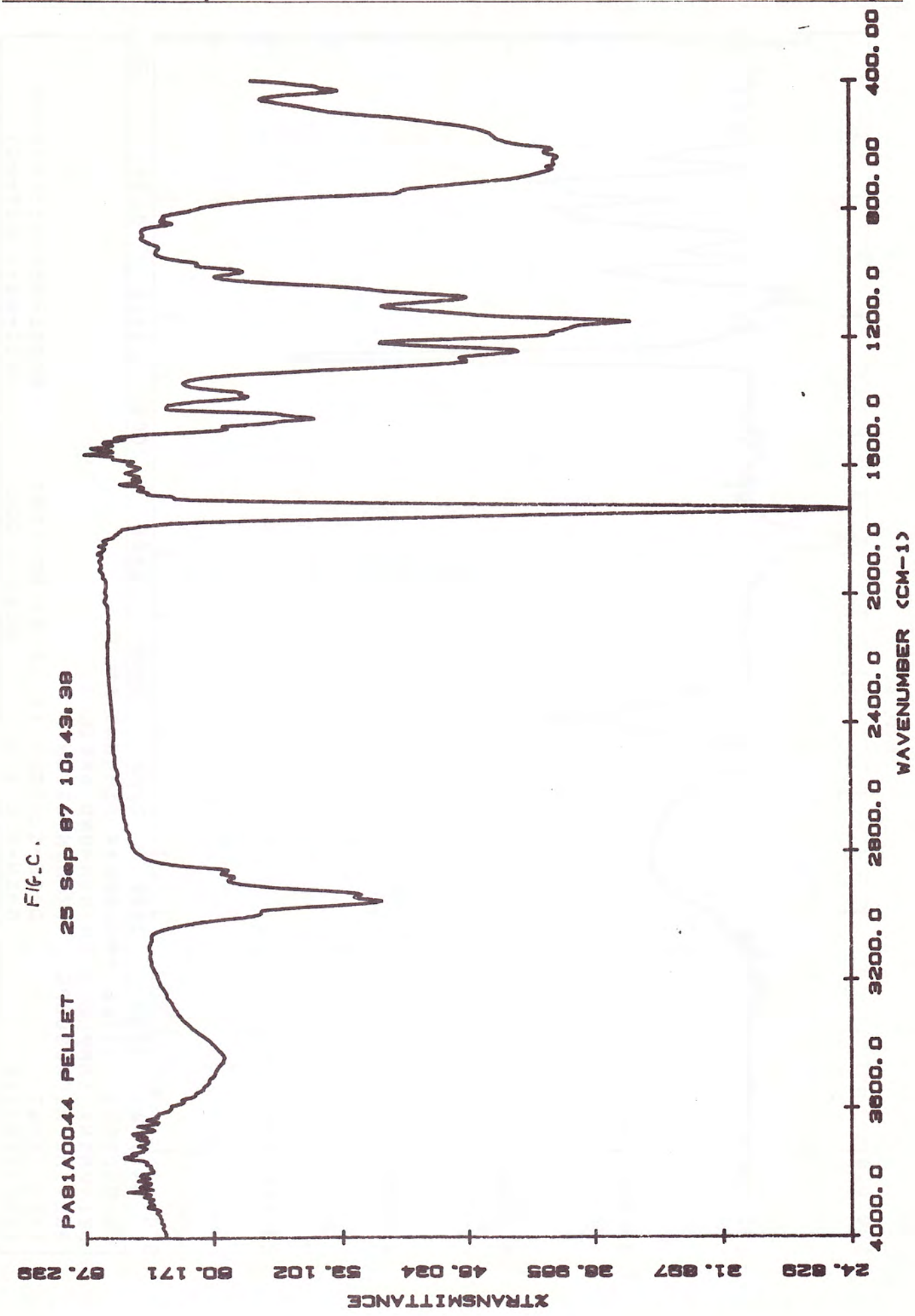


Fig.C.
PA81A0044 PELLET 25 Sep 87 10:43:38
TRANSMITTANCE
87.238
80.171
53.102
46.034
38.965
31.897
24.829
4000.0
3600.0
3200.0
2800.0
2400.0
2000.0
1800.0
1200.0
800.00
400.00
WAVENUMBER (CM-1)

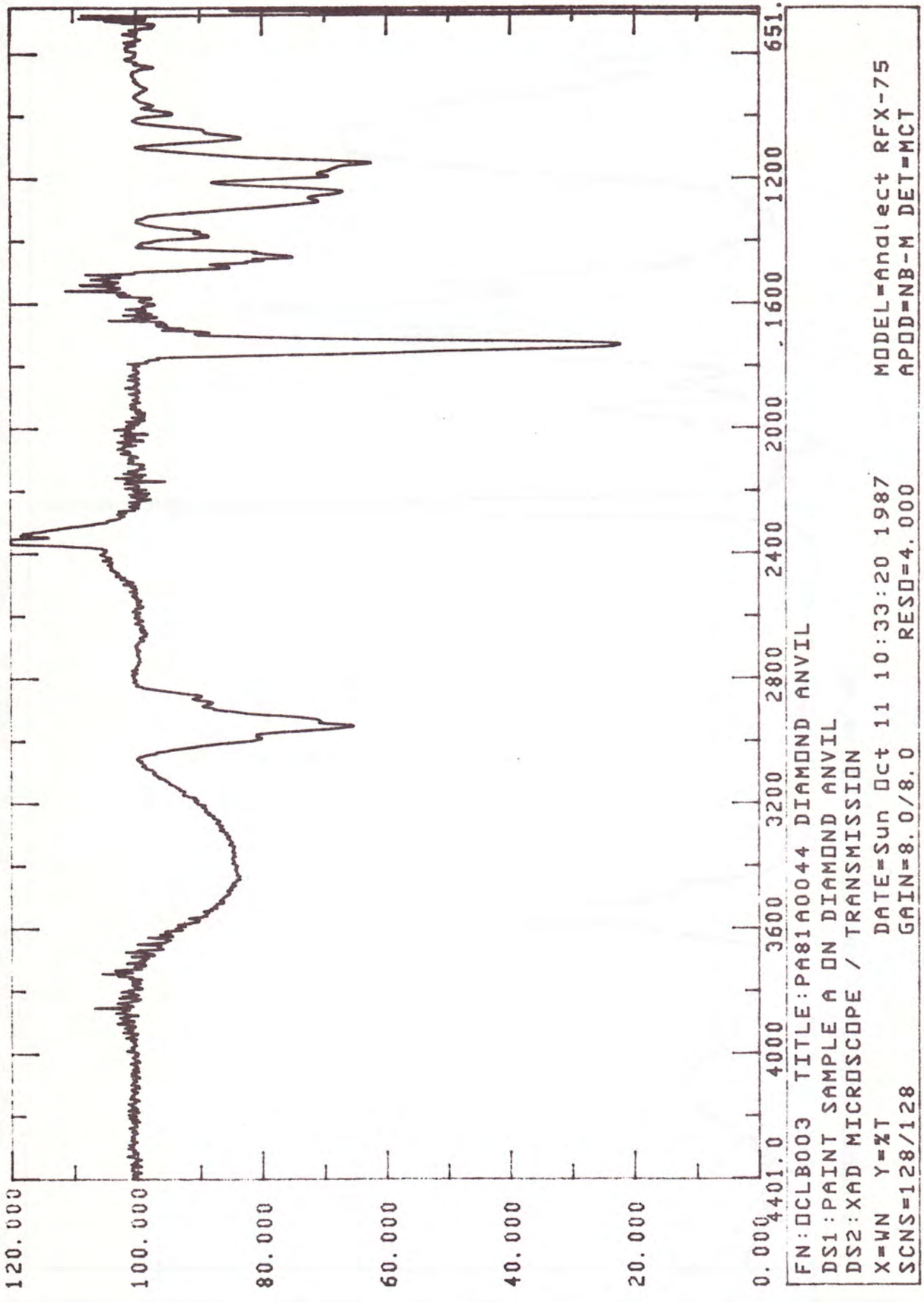

120.000
100.000
80.000
60.000
40.000
20.000
0.000
4401.0
4000
3600
3200
2800
2400
2000
1600
1200
651.
FN:DCLB003 TITLE:PA81A0044 DIAMOND ANVIL
DS1:PAINT SAMPLE A ON DIAMOND ANVIL
DS2:XAD MICROSCOPE / TRANSMISSION
X=WN Y=%T DATE=Sun Oct 11 10:33:20 1987 MODEL=Analect RFX-75
SCNS=128/128 GAIN=8.0/8.0 RESO=4.000 APOD=NB-M DET=MCT

Fig. D.

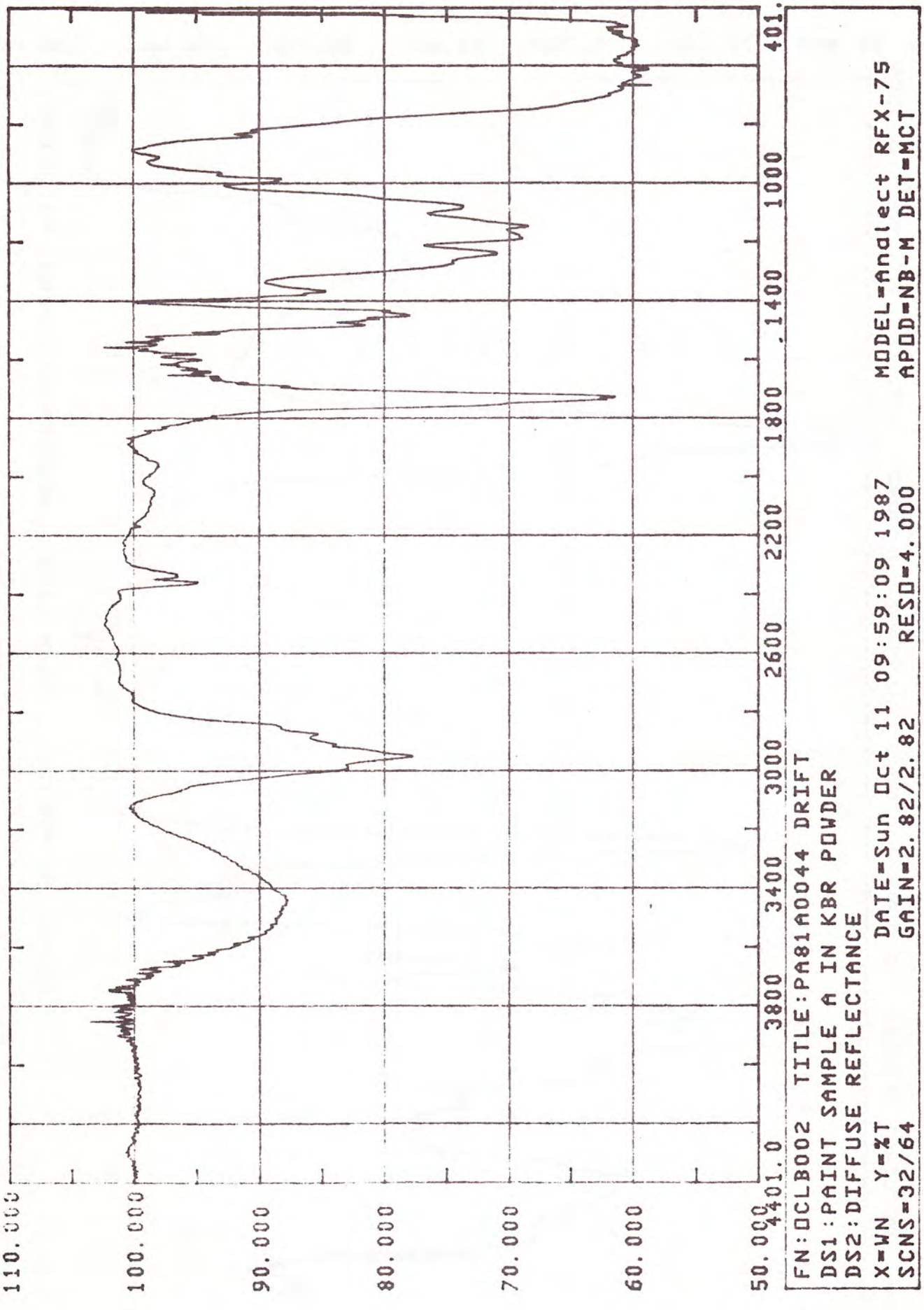

110.000
100.000
90.000
80.000
70.000
60.000
50.000
4401.0
3800
3400
3000
2600
2200
1800
1400
1000
401.
FN:DCLB002 TITLE:PA81A0044 DRIFT
DS1:PAINT SAMPLE A IN KBR POWDER
DS2:DIFFUSE REFLECTANCE
X=WN Y=%T DATE=Sun Oct 11 09:59:09 1987 MODEL=Analect RFX-75
SCNS=32/64 GAIN=2.82/2.82 RESO=4.000 APOD=NB-M DET=MCT

FIG. E.

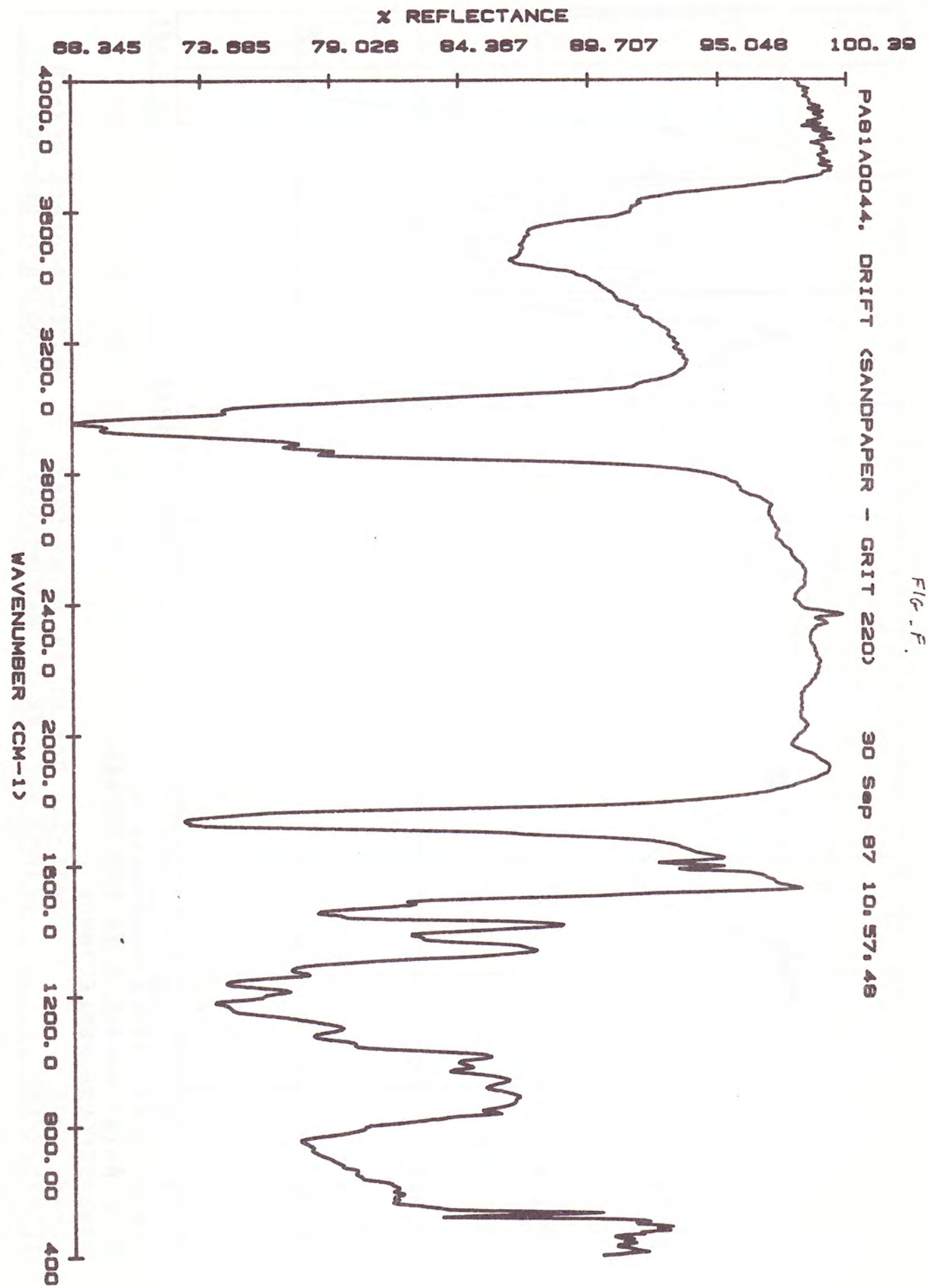

% REFLECTANCE
88.345
73.685
79.026
84.367
89.707
95.048
100.39
4000.0
3600.0
3200.0
2800.0
2400.0
2000.0
1600.0
1200.0
800.00
400
WAVENUMBER (CM-1)
PA81A0044. DRIFT (SANDPAPER - GRIT 220) 30 Sep 87 10:57:48

FIG. F.

# Northern California Drug Study Group

***Ken Fujii***

*Contra Costa Sheriff's Office*
*Criminalistics Laboratory*

## Meeting of September 24, 1987 - San Mateo County Sheriff's Office

Robert Turkington of HazTech Systems presented a scheme for the identification of chemicals that might be found at road spills. The scheme consists of a logical series of chemical spot tests and the use of a chemical reagent kit. Both the kit and training are available through his company, HazTech Systems, 2218 Old Middlefiled Way, Suite J, Mountain View CA, 94043. Phone (415)968-6025.

This information would be useful for the categorization of hazardous chemicals from drug labs or the identification of chemical evidence.

Pegy Stevenson, DEA San Francisco, presented a ton of information in her paper on by-products formed in the synthesis of methamphetamine from P2P and methylamine.

Linton vonBeroldingen passed out information about:

1.A booby trap hazard consisting of a shock sensitive mixture of red phosphorous and potassium chlorate wrapped in aluminum foil.

2.The hydrogenation on N-methylephedrine to make dimethylamphetamine. (This product is federally controlled as a Schedule II methamphetamine analog. For further information, contact Tom Abercrombie, DOJ Riverside (714)782-4170.

## Meeting of November 12, 1987 -- San Mateo Sheriff's Office

John Bowden of the California Criminalistics Institute discussed the analysis of anabolic steroids and their esters. These compounds are usually in capsules dissolved in food oil or solid tablet form.

The TLC system used by the FDA is useful for screening, but not identification. GCMS or IR are the methods of choice. Most of the compounds can be found in the NBS Steroid or USP reference libraries.

STERALOIDS, INC., Post Office Box 310, Wilton, NH 03086 is a useful resource. They offer standards but they haven't provided MSDS's. Anabolic steroids are carcinogenic so they should be handled carefully. A handout was distributed.

Mr. Lansing Lee reported on the Drug Study Group Meeting held in conjunction with the '87 CAC Seminar.

Dimethylamphetamine is reported as far North as Kern County. Color tests are a positive Marquis, a positive CoSCN, and negative secondary amine test. Identification is by IR. Mass Spec cannot distinguish it from other analogs. Large quantities of the precursor have been delivered to RJM in Southern California. The precursor may soon be available in Sacramento.

Crystal tests vs. Instrumental identification was debated. The DOJ-TAG will be making a recommendation soon. It will appear in the TIELINE.

Ken Fujii reported that the CAC had requested the Drug Study Group to review the DOJ Clandestine Laboratory Manual to determine the impact of the protocol on the way clan labs are processed, and a review for technical correctness. He reviewed the manual and conducted a telephone survey to determine impact. His results were reported to Faye Springer. The report is available for review.

Legal Updates

AB 2501, effective 1-1-88. The bill expands 11383 H&S to include combinations of ephedrine, pseudoephedrine, norpseudoephedrine or phenylpropanolamine, plus hydroidic acid, thionyl chloride and hydrogen gas, phosphor us pentachloride and hydrogen gas or any other reducing agent.

AB 2574, ammends 11372 H &S. Effective 1-1-88. Persons receiving additional terms as specified in 11370.4 H & S my also be fined as follows.

3 lbs up to $1,000,000
10 lbs up to $4,000,000
25 lbs up to $8,000,000

The court must determine that there is a reasonable expectation of collecting the fine.

SB 943, effective 9-26-87

Changes: "Cocaine (except cocaine hydrochloride)" in Schedule I to "cocaine base".

Changes: "Cocaine hydrochloride" in Schedule II to "cocaine, except as specified in section 11054"

Changes: 1203.07 (a) (4) PC to '....possessing for sale 14.25 grams or more of any salt or solution of phenyclidine ..."

Adds: "or a substance containing 14.25 grams or more of cocaine base"..."or 57 grams or more of a substance containing at least five grams of cocaine base"... to 1203.073 (b) (5) PC.

Discussion Topics

LAB/DRUG SUBMISSION & CLAN LABS

SMCSO: Marijuana, cocaine, tar Heroin.
crank, PCP labs

DOJ Salinas: LSD coming back, PCP
Meth labs in San Jose &Santa Cruz

Alameda County: LSD from Berkeley

Santa Clara County: 30% of cases are PCP, the usual cocaine, marijuana, etc. LSD and Hash picking up, Anabolic Steroids .

DOJ Santa Rosa: Nothing unusual. DEA task force active in Northbay Counties

Fresno County: PCP base-appears like crack, PCP in MJ joints, Heroin-cocaine mixture.

DOJ Fresno: Tar Heroin, Meth, Cocaine. More HCl than base, liquid. PCP from South, solid PCP from San Jose
Labs: Both HI and P2P, mostly as dumps

DOJ Sacramento: Cocaine up dramatically
Labs: Number of labs doubled from 1985- 1987

DEA-SF one ounce of very pure LSD
Labs: Fewer labs, cookers tartrate diversifying, use multiple routes

Oakland - 10 g MDMA (Greatful Dead in town) White heroin in balloons.

Comments

- Cookers are using mole sieve to dry solvents.
- A condenser burst into flames at a red phosphorous lab in Las Vegas.
- Tests for red phosphorous.
- Nick Stumbaugh distributed descriptions of two methods he uses. Roger Ely converts a small amount of white phosphorous inside a transfer pipette. Squeezing the bulb produces a mini blowtorch as the white phosphorous burns. Contact Roger at DEA-SF for specific details.

Handouts

1. 1987 California Waste Exchange, Directory of Industrial Recycles.

2. California Waste Exchange, Newsletter/Catalog Vol. 6, No. 1, 1987.

3. One set of reference articles received from Janssen Pharmaceuticals was passed round for review. Ken Fujii will copy the articles for those who want them. However, one group of about seven articles was not returned. If anyone happens to find them please return them to Ken Fujii.

4. "Hazardous Materials Identification, A Quick Field Identification of Unknown Materials" by Robert Turkington.

## CAC Committees - 1987-1988

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