

ASCLD/LAB

INSPECTION REPORT

NORTH CAROLINA
STATE BUREAU OF INVESTIGATION
WESTERN REGIONAL LABORATORY
ASHVILLE, NORTH CAROLINA

INSPECTED JUNE 9, 1993

SUBMITTED BY INSPECTION TEAM:

ELDON STRAUGHAN, SITE LEADER
KEVIN LOTHRIDGE

REPORTED JUNE 17, 1993

INTRODUCTION

The North Carolina State Bureau of Investigation Western Regional Laboratory, Ashville, North Carolina was inspected by an Inspection Team consisting of Eldon Straughan, Chief, Crime Laboratory Division, Texas Department of Public Safety, Austin, Texas (Site Leader) and Kevin Lothridge, Chief Forensic Chemist, Pinellas County Forensic Laboratory, Largo, Florida. The Laboratory was inspected June 9, 1993.

LABORATORY OVERVIEW

The North Carolina State Bureau of Investigation Western Regional Laboratory provides laboratory service to 25 western counties in the areas of drug analysis, latent evidence and arson analysis. These services are provided to a population of about 1,200,000.

The Laboratory is directed by Acting Supervisor David Barnes who reports to Assistant Director Harold Elliott through Deputy Assistant Director Ralph Keaton, both located in Raleigh.

The Laboratory has an authorized staff of 7, including the Acting Supervisor. An organizational chart and staff roster (Appendix A) is attached.

10000 LABORATORY MANAGEMENT AND OPERATION

All of the criteria in this series were answered with a YES; however, the Inspection Team thought the following comments were needed.

11114 (I) (YES)

DOES THE LABORATORY HAVE A FORMAL WRITTEN BUDGET?

The Laboratory in Ashville is included in the Raleigh budget. The Ashville Laboratory has input to the preparation of this budget.

11221 (I) (YES)

LABORATORY SAFETY

The Inspection Team felt the chemicals in this Laboratory should be separated by class of compound rather than strictly alphabetical.

11224 (I) (YES)

MAINTENANCE AND CALIBRATION OF EQUIPMENT AND INSTRUMENTS.

The only written procedures were those of the equipment manufacturers.

14161 (E) (YES)

IS EVIDENCE STORED UNDER PROPER SEAL?

Some cans of arson debris were being returned to the local (Ashville) agency without the cans being sealed. Because others are boxed and wrapped for return, they were not aware of this condition. All cans will be sealed for return in the future.

14231 (E) (YES)

DOES THE LABORATORY ROUTINELY CHECK THE RELIABILITY OF ITS REAGENTS?

Yes, but the Inspection Team recommends recording this in a permanent log.

14251 (E) (YES)

IF THE LABORATORY HAS AN INDICATION OF A TECHNICAL PROBLEM, ARE THERE PROCEDURES WHEREBY THE LABORATORY IMMEDIATELY INITIATES A REVIEW AND TAKES ANY CORRECTIVE ACTION REQUIRED?

The Inspection Team recommends a written procedure covering this area.

20000 PERSONNEL QUALIFICATIONS

21141 (D) (NO)

DID THE LABORATORY DIRECTOR HAVE AT LEAST FIVE YEARS FORENSIC EXPERIENCE PRIOR TO BECOMING DIRECTOR?

As noted on the application.

23111 thru 23131 (N/A)

TOXICOLOGY

As noted on the application, no toxicology is done in this Laboratory.

24131 (D) (N/A)

DOES THE TRACE EVIDENCE EXAMINER HAVE ACCESS TO WELL ESTABLISHED DATA BASES FOR WHICH HE ASSIGNS PROBABILITIES?

As noted on the application. No probabilities are assigned.

24132 (D) (N/A)

DOES THE TRACE EVIDENCE EXAMINER HAVE ACCESS TO AND GENERATE LOCAL DATA BASES FOR ALL TRACE EVIDENCE TYPES FOR WHICH HE ASSIGNS PROBABILITIES?

As noted on the application. No probabilities are assigned.

25111 thru 25142 (N/A)

SEROLOGY

As noted on the application. No serology is done in this Laboratory.

25211 thru 25214 (N/A)

DNA ANALYSIS

As noted on the application. DNA analysis is not done in this Laboratory.

26111 thru 26151 (N/A)

FIREARMS/TOOLMARKS

As noted on the application. No Firearms/Toolmarks are done in this Laboratory.

27111 thru 27151 (N/A)

DOCUMENTS

As noted on the application. No Documents are done in this Laboratory.

29131 (E) (N/A)

IF APPROPRIATE, WAS PROFICIENCY TESTING SUCCESSFULLY COMPLETED?

Evidence control person does not manipulate evidence, just the containers. Blind proficiency samples that pass through the area are a form of proficiency for evidence control.

3000 PROCEDURES AND INSTRUMENTS/EQUIPMENT

31121 (E) (NO)

ARE APPROPRIATE CONTROLS SPECIFIED IN THE PROCEDURES AND ARE THEY USED?

Laboratory policy requires the use of a weekly standard and blanks in arson analysis. This policy is not being followed routinely. A written directive was issued (See Appendix B). The Inspectors accept the measures taken as being adequate and have no reason to doubt the continued adherence to the directive.

40000 PHYSICAL PLANT, SECURITY, AND SAFETY

44161 (I) (YES)

ARE INSTRUCTIONS AND PROCEDURES AVAILABLE FOR HANDLING AND USING CARCINOGENIC, TOXIC AND/OR DANGEROUS SUBSTANCES?

The Inspection Team recommends training in this area.

SUMMATION OF EVALUATION CRITERIA

	Total Possible	Total Yes	Total No	Percent Yes
Essential	39	38	1	97.4
Important	44	40	0	100
Desirable	35	34	1	97.1

SUMMARY AND RECOMMENDATIONS

The members of the Inspection Team are most appreciative of the staff for their cooperation and hospitality during the inspection.

Few deficiencies were noted in the inspection. Corrective action has been taken (Appendix B) to correct the deficiency noted for 31121. The Inspection Team believes this action corrects this deficiency.

The Inspection Team recommends (subject to the Board's acceptance of the correction of the deficiency for 31121). that the North Carolina State Bureau of Investigation, Western Regional Laboratory at Ashville be granted accreditation in the areas of controlled substances, latent prints and trace (arson only).



Eldon Straughan, Site Leader

GRADE COMPUTATION SHEETS

CRITERIA	ESSENTIAL			IMPORTANT			DESIRABLE		
	Y	N	N/A	Y	N	N/A	Y	N	N/A
11111 (D)							✓	—	—
11112 (D)							✓	—	—
11113 (D)							✓	—	—
11114 (I)				✓	—	—			
11115 (I)				✓	—	—			
11211 (E)	✓	—	—						
11212 (E)	✓	—	—						
11221 (I)				✓	—	—			
11222 (D)							✓	—	—
11223 (D)							✓	—	—
11224 (I)				✓	—	—			
11225 (D)							✓	—	—
11226 (I)				✓	—	—			
11227 (I)				✓	—	—			
11228 (I)				✓	—	—			
11229 (D)							✓	—	—
1122(10) (D)							✓	—	—
1122(11) (D)							✓	—	—
1122(12) (I)				✓	—	—			
12111 (D)							✓	—	—
12112 (D)							✓	—	—
12113 (D)							✓	—	—
E/I/D = 2/8/12									
TOTALS	2	—	—	8	—	—	12	—	—

LABORATORY Asheville N.C.

CRITERIA	ESSENTIAL			IMPORTANT			DESIRABLE		
	Y	N	N/A	Y	N	N/A	Y	N	N/A
14311 (E)	<u>✓</u>	<u>—</u>	<u>—</u>						
14322 (E)	<u>✓</u>	<u>—</u>	<u>—</u>						
14333 (I)				<u>✓</u>	<u>—</u>	<u>—</u>			

E/I/D = 2/1/0

TOTALS 2 — — 1 — — — — —

LABORATORY Ashville NC

CRITERIA	ESSENTIAL			IMPORTANT			DESIRABLE		
	Y	N	N/A	Y	N	N/A	Y	N	N/A
14141 (E)	<u>✓</u>	—	—						
14151 (E)	<u>✓</u>	—	—						
14161 (E)	<u>✓</u>	—	—						
14171 (D)							<u>✓</u>	—	—
14172 (E)	<u>✓</u>	—	—						
14181 (D)							<u>✓</u>	—	—
14211 (E)	<u>✓</u>	—	—						
14221 (E)	<u>✓</u>	—	—						
14231 (E)	<u>✓</u>	—	—						
14241 (E)	<u>✓</u>	—	—						
14242 (E)	<u>✓</u>	—	—						
14251 (E)	<u>✓</u>	—	—						
14261 (E)	<u>✓</u>	—	—						
21111 (I)				<u>✓</u>	—	—			
21121 (D)							<u>✓</u>	—	—
21131 (D)							<u>✓</u>	—	—
21141 (D)							<u>✓</u>	<u>X</u>	—
22111 (E)	<u>✓</u>	—	—						
22121 (E)	<u>✓</u>	—	—						
22131 (E)	<u>✓</u>	—	—						
23111 (E)	—	—	<u>✓</u>						
23121 (E)	—	—	<u>✓</u>						

E/I/D = 16/1/5

TOTALS 14 - 2 1 - - 4 1 -

LABORATORY Ashville NC

COMP-3

Rev. August, 1992

CRITERIA	ESSENTIAL			IMPORTANT			DESIRABLE		
	Y	N	N/A	Y	N	N/A	Y	N	N/A
25211 (E)	—	—	✓						
25212 (E)	—	—	✓						
25213 (E)	—	—	✓						
25214 (E)	—	—	✓						

E/I/D = 4/0/0

TOTALS

— — 4 — — — — — —

LABORATORY

Asheville N.C.

CRITERIA	ESSENTIAL			IMPORTANT			DESIRABLE		
	Y	N	N/A	Y	N	N/A	Y	N	N/A
28121 (E)	<u>✓</u>	—	—						
28131 (E)	<u>✓</u>	—	—						
28141 (D)							<u>✓</u>	—	—
28151 (E)	<u>✓</u>	—	—						
29111 (E)	<u>✓</u>	—	—						
29121 (E)	<u>✓</u>	—	—						
29131 (E)	—	—	<u>✓</u>						
31111 (E)	<u>✓</u>	—	—						
31121 (E)	<u>✓</u>	<u>X</u>	—						
31131 (E)	<u>✓</u>	—	—						
31141 (I)				<u>✓</u>	—	—			
31151 (I)				<u>✓</u>	—	—			
31161 (E)	<u>✓</u>	—	—						
31171 (E)	<u>✓</u>	—	—						
31181 (E)	<u>✓</u>	—	—						
41111 (I)				<u>✓</u>	—	—			
41121 (I)				<u>✓</u>	—	—			
41131 (D)							<u>✓</u>	—	—
41141 (I)				<u>✓</u>	—	—			
41151 (I)				<u>✓</u>	—	—			
41161 (E)	<u>✓</u>	—	—						

E/I/D = 13/6/2

TOTALS 11 1 1 6 0 0 2 0 0

LABORATORY Asheville NC

CRITERIA	ESSENTIAL			IMPORTANT			DESIRABLE		
	Y	N	N/A	Y	N	N/A	Y	N	N/A
43171 (E)	✓	—	—						
44111 (I)				✓	—	—			
44121 (I)				✓	—	—			
44131 (I)				✓	—	—			
44141 (I)				✓	—	—			
44151 (I)				✓	—	—			
44161 (I)				✓	—	—			
44171 (I)				✓	—	—			
44181 (I)				✓	—	—			
44191 (I)				✓	—	—			

E/I/D = 1/9/0

TOTALS 1 — — 9 — — — — —

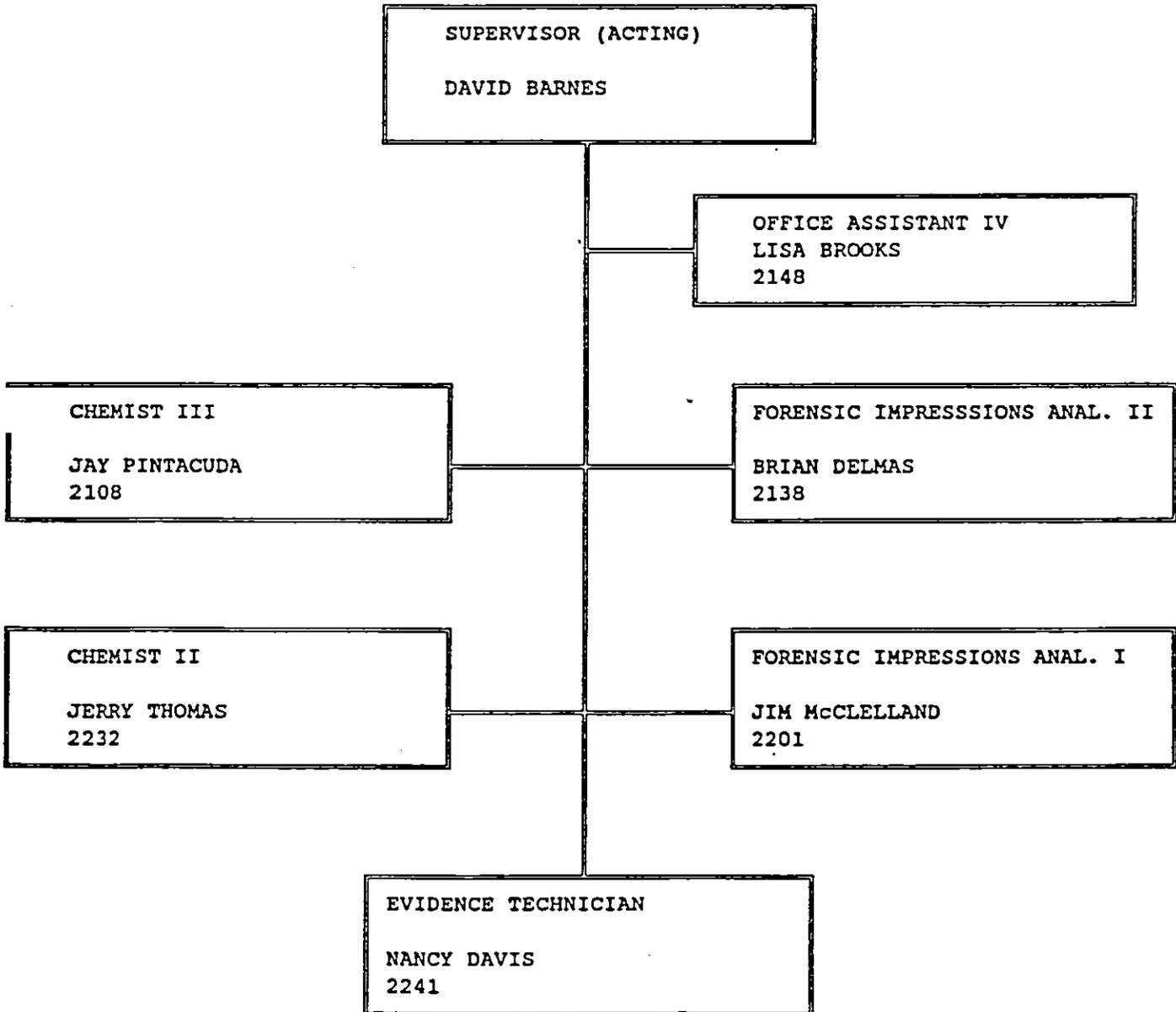
LABORATORY Ashville NC

STATE BUREAU OF INVESTIGATION
CRIME LABORATORY DIVISION

WESTERN REGIONAL CRIME LABORATORY

Harold Elliott - Assistant Director

Ralph Keaton - Deputy Assistant Director





NORTH CAROLINA
STATE BUREAU OF INVESTIGATION
DEPARTMENT OF JUSTICE



3320 GARNER ROAD
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RALEIGH, N.C. 27626-0500

MICHAEL F. EASLEY
ATTORNEY GENERAL

JAMES J. COMAN
DIRECTOR

MEMORANDUM

TO: S/A Jerry B. Thomas

FROM: D.B. Barnes (Acting Supervisor) *DBB*

SUBJECT: Arson Examination Technical Procedures

DATE: June 09, 1993

Effective June 09, 1993 the attached Technical Procedures for the examination of arson evidence will be implemented. As arson examiner you are responsible for carrying out these procedures.

cc: Deputy Assistant Director Ralph Keaton
Western Regional Lab File
DBB/mb

PROCEDURES FOR CALIBRATION OF GAS CHROMATOGRAPH

NOTE : Calibration procedures are to be conducted weekly (Monday morning) with results recorded and filed.

1. Set parameters as follows:
 - Initial oven temperature- 60 degrees C.
 - Final oven temperature- 320 degrees C.
 - Program rate- 30 degrees C. per min.
 - Injector temperature- 280 degrees C.
 - FID temperature- 350 degrees C.
 - Flow rate- in accordance with operations manual.
 - Detector- in accordance with manufacturers specs.
 - Column rate- 1.5-2 ml/min.
2. Follow first three steps of Gas Chromatograph working procedures.
3. Inject 1 ul of calibration mixture.
4. Compare Retention times and relative areas to standard chromatograms.
5. Correct any difficulties (examples: leaks, dirty detectors, column deterioration, etc.).
6. Records of calibration results will be kept on file.

GAS CHROMATOGRAPH WORKING PROCEDURES

NOTE: It may be necessary (and is advised) that the manufacturers operation manual be consulted.

1. Insure column and instrument are clean and ready for use. Establish by "Blank Run".
2. "Cool Down" instrument to initial temperature.
3. Await "Ready" light.
4. Inject sample with appropriate syringe.
5. Consult proper section of procedures manual for "Vista" work station instruction.
6. Adjust attenuation and stop time where and when appropriate.

NOTE: Refer to the operational manual for routine GC maintenance of: detectors, injectors, columns, and electronics.

HEATED HEAD SPACE

NOTE: Heated head space procedure should be utilized when the presence of a solvent type odor has been detected.

1. Puncture a small hole in the sample container and then cover the hole with adhesive tape. (Nylon and comparable arson bags do not need to be punctured prior to heating). Evidence containers with septum caps may be used for ease of analysis.
2. Place the sample container a temperature controlled oven at 100 degrees C. for approximately 10 to 15 minutes.
3. Remove container from oven and IMMEDIATELY obtain a 1-3 ml vapor sample.
4. The sample is now ready for the IMMEDIATE injection into the gas chromatograph.

NOTE: If negative results are obtained, proceed with the adsorption elution technique.

STEAM DISTILLATION

1. Transfer debris to a glass kettle.
2. Add water until the kettle volume is 1/2 to 2/3 full.
3. Cover with lid and clamp.
4. Place kettle in variac heating apparatus.
5. Attach the collection trap to the appropriate position on the kettle lid.
6. Attach the cold water condenser to the collection trap.
7. Apply adequate water pressure to the condenser by turning on the cold water faucet and monitoring its pressure through the condenser.
8. Apply heat by adjusting variac setting to 70% current to heating mantle.
9. After boiling begins check and if needed, adjust variac setting to control the boiling rate. Also, check water flow to condenser to insure proper condensation.
10. Allow boiling to continue until organic layer (on surface of water) remains constant.
11. When distillation is complete turn off variac and allow apparatus to cool.
12. Pipette the organic layer from the collection trap into a suitable clean test tube or vial.
13. The sample is now ready for analysis by Gas Chromatography.

SOLVENT EXTRACTION

NOTE: Solvent extraction procedures should be utilized when the sample container has been opened and an odor (accelerant type) has been detected.

1. Place a portion of debris in a clean glass beaker.
2. Add an adequate amount (up to 25ml) of appropriate solvent (petroleum ether).
3. Using a Pasteur pipet rinse the collected fraction of sample by pipetting the solvent over the debris several times.
4. Separate the petroleum ether from any water that may be present.
5. Evaporate the sample under a current of clean nitrogen.
6. The sample is now ready for analysis by Gas Chromatography.

NOTE: If negative results are obtained proceed with adsorption elution.

ADSORPTION ELUTION

NOTE: Adsorption elution procedures are to be utilized in accordance with the arson analysis flow chart.

1. Transfer sample to a virgin paint can and replace the lid with one that has been altered for charcoal tube recovery.
2. Place container into a temperature controlled heating mantle.
3. Attach (already prepared) charcoal tube to the outlet portion of the lid (NOTE: charcoal tube preparation is located on the following page).
4. Push a positive flow of nitrogen through the sample container by attaching the Tygon tube, which is connected to a current of clean nitrogen, to the inlet portion of the lid.
5. Set the temperature controller so that the mantle will not heat the container above 120 degrees C.
6. Allow the sample to remain heated a sufficient time (a minimum of 15 minutes).
7. Remove charcoal collection tube and place it in a properly marked test tube.
8. Using approximately 1-2 ml of carbon disulfide, extract the eluate from the charcoal tube.
9. Separate the carbon disulfide from any water that may be present, and if necessary concentrate the sample by evaporation with dry nitrogen gas.
10. The sample is now ready for analysis by gas chromatography.

NOTE: Clean up procedures for lids are critical.

PROCEDURES FOR THE CONSTRUCTION OF CHARCOAL COLLECTION TUBES

1. Push a small portion of fiber glass down to the neck end of a Pasteur pipet.
2. Add approximately 1 inch of activated charcoal and let it settle on the fiber glass in the Pasteur pipet.
3. Add a small portion of fiber glass on top of the activated charcoal to keep the charcoal in place.
4. Cut a one inch piece of Tygon tubing and fit it around the base of the Pasteur pipet.

EXTRACTION PROCEDURES FOR PARAFFIN

1. Bake out gas chromatograph at 340 degrees for 10 minutes or longer.
2. Set GC parameters as follows:
 - A. Initial oven temperature = 250 degrees C.
 - B. Final oven temperature = 340 degrees C.
 - C. Program rate = 10 degrees C. per minute.
3. Place 10 mg of suspected paraffin in test tube or vial.
4. Add approximately 1-2 ml of carbon disulfide.
5. Agitate and dissolve paraffin.
6. Inject approximately 1 ul of solution into the gas chromatograph.

NOTE: Components of paraffin should elute in 10 minutes and appear in a bell shaped distribution.

PROCEDURES FOR THE EXAMINATION OF INCENDIARY DEVICES

1. The evidence should be completely documented (notes, diagrams, photographs, etc.).
2. Attempt to separate components (accelerants, igniters, delay devices, etc.).
3. Analytical approaches (Gas Chromatography, FTIR, SEM, AA, X-Ray Diffraction, GC/MS, or Micro Analysis) are determined by visual and/or microscopic examination.
4. Identify any accelerants present.
5. Identify components (cloth, flares, wires, timer, etc.).
6. Develop a theory of how the device was intended to work. Establish if the device could have functioned as it was intended.



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MICHAEL F. EASLEY
ATTORNEY GENERAL

JAMES J. COMAN
DIRECTOR

MEMORANDUM

TO: D.B. Barnes Acting Supervisor *DB*

FROM: S/A. Jerry B. Thomas *JBT*

SUBJECT: Calibration of Gas Chromatograph

DATE: June 09, 1993

A calibration of the Gas Chromatograph used for Arson Analysis was made today, June 09, 1993 at 4:00 P.M. This calibration has been entered into a calibration file that has been established.

JBT/mb
cc: Ralph Keaton