SAFETY GUIDELINES FOR LIGHTWAVE TRANSMISSION SYSTEMS

CONTENTS

EXHIBITS

PROPRIETARY

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1. GENERAL

1.01 This section identifies potential hazards to safety and health associated with Lightwave Transmission Systems and prescribes guidelines for their evaluation and control. These guidelines parallel letter (DS) 270.0103 - Operation Planning - Guidelines for Installation and Maintenance of Fiber Optics, revised, February, 1985.

1.02 This section is being reissued to comply with changes made by the Food and Drug Administration, 21 CFR Parts 1000 and 1040, Laser Products; Amendments to Performance Standard.

The FDA amendment changes the methods of measurement for purposes of laser classification placing the majority of laser transmitters used in telecommunications Lightwave Transmission Systems in Class I (from Class III-B) thereby eliminating the federal requirement for "Danger" labels on associated equipment.

This change also deletes reference to vendor specific names of lightwave transmission systems.

1.03 The purpose of this section is to provide guidelines for the safe use of Lightwave Transmission Systems (LTS) including LED (light emitting diode) systems. These guidelines are intended for use by personnel who are responsible for the installation, operation, maintenance and repair of lightwave transmission systems owned, operated by, or operated under the direction of Southwestern Bell.

1.04 In addition, this document identifies potential hazards to safety and health associated with lightwave transmission systems and prescribes suitable means for their evaluation and control.

1.05 Safety precautions referred to in all other practices concerning installation and maintenance will also be adhered to.

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2. TECHNICAL INFORMATION

2.01 Background

Lightwave Transmission systems and the associated optical test sets that use semiconductor laser transmitters emit light at wavelengths of 0.82 micrometers (820 nanometers) and greater into lightguide cables. The emitted light is at the red end of the visible spectrum. Although officially designated as invisible, most people can see light at this wavelength even at very low levels, (levels several orders of magnitude below any that have been shown to cause injury to the eye). Lasers and laser products are subject to Federal and State Regulations and to Southwestern Bell standards.

Lightwave systems that use LED transmitters generally emit light at wavelengths greater than 1.0 micrometers (1000 nanometers). These wavelengths are in the near infrared region of the spectrum and usually cannot be detected by the human eye.

2.02 Applicable Regulations

The manufacture of lasers and laser products (this does not include LEDs) is regulated by the FDA's Center for Devices and Radiological Health (CDRH) under 21 CFR 1040. Copies of these regulations are available from the Department of Health and Human Services (HHS) as FDA Publication 79-8035. These regulations require manufacturers to certify each laser or laser product as Class I, II, III, or IV, depending on the characteristics of the laser emission. In addition, specific labeling, interlock, beam attenuator etc., requirements are specified for each class.

Various states also have issued user regulations covering lasers and laser products. Additional information may be obtained from the Company Safety Coordinator. Bell Operating Companies must comply with the specific regulations that apply in their states. (SEE EXHIBIT 1.)

2.03 Lightwave Transmission Systems Utilizing Laser Transmitters

Virtually all terrestrial Lightwave Digital Transmission systems use a Class I semiconductor laser transmitter. In normal operation, these systems are totally enclosed and fully shielded by protective devices. Under these conditions there is no accessible laser emission and hence it presents no hazard to safety or health. For this reason these systems have been certified by CDRH as Class I systems (Exempt Lasers and Laser Systems).

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The lightguide cables which interconnect various components in the systems can, however, be deliberately disconnected or accidentally broken and under some circumstances permit human access to lightwave emission. Also, certain measurements and maintenance procedures may permit direct access to the emission from the Class I semiconductor laser during installation and servicing. Normally, emission from a Class I laser can not cause damage to the eye.

The emission pattern of a semiconductor laser however is a highly divergent beam unlike that of conventional lasers. This means that the power density in the beam and hence any potential risk for eye injury decreases rapidly with distance from the output connector. Inadvertently viewing an unterminated energized connector, with the unaided eye, at distances greater than that at which the eye can focus (approximately 10 inches) for example, looking into a vacant regenerator slot, will not cause eye injury. However, damage may be possible if an "Optical instrument" is used to stare into the laser emission for a long period of time. ("Optical instrument": As used here includes a microscope, magnifying glass, eye loupe, etc., but does not include corrective eyewear or an indirect image converter such as the Find-R-Scope.)

As a precaution no one should attempt to verify the presence of a light signal at the end of a fiber or from a connector by looking directly into the end of a fiber or connector. The Find-R-Scope, or similar device, must be used to determine if a fiber is energized (see part 10 of this section for guidelines). In addition, under no circumstances should fiber continuity be verified by shining a flashlight into one end and viewing the other end of the fiber. The recommended method for verifying fiber continuity is the use of optical loss test sets.

2.04 LED Systems

Digital lightwave transmission systems that use LED transmitters generally emit light at wavelengths greater than 1.0 micrometers (1000 nanometers). The potential risk for injury from an LED system is less than that from a similar system utilizing a laser transmitter.

However, for purposes of uniformity and safety (since the type of transmitter may not always be known) all safety procedures that apply to the laser systems shall also apply to the LED systems.

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2.05 Test Sets

There are at present at least two different types of optical test sets in use; e.g., the Optical Loss Test Set (OLTS); and the Optical Time Domain Reflectometer (OTDR).

The fiber optic test sets used by Southwestern Bell utilize either semiconductor Laser Diodes (LDs) or Light Emitting Diodes (LEDs) as transmitting sources. These devices emit light at wavelengths of 820 nanometers and greater. However, unlike laser based systems, LED based systems are not regulated by the Centers for Devices and Radiological Health (CDRH) and therefore do not require certification, registration and labels as are required for laser products. However, all control measures in Section 4 also apply to the use of the optical test sets.

3. SPECIFIC RESPONSIBILITIES

3.01 General

The General Headquarters Assistant Vice Presidents Organization are responsible for:

(a) Providing background information on lasers and lightwave transmission systems.

(b) Providing laser classification and laser safety information.

(c) Providing guidance on the use and adequacy of laser safety equipment and practices.

3.02 Safety Organization

The Southwestern Bell safety organization is an integral part of the lightwave safety program Specific responsibilities include:

(a) Obtaining and maintaining an official file of the appropriate Federal, State, local and company regulations applicable to lightwave transmission systems.

(b) Ensuring that lightwave transmission systems are classified by the manufacturer in accordance with all applicable CDRH regulations.

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(c) Conducting periodic safety surveys to insure that prescribed practices and procedures are being followed.

(d) Coordinating the educational, engineering, supervisory and enforcement activities related to the safety program for lightwave transmission systems.

3.03 Supervisor's Responsibilities

The supervisor is responsible for maintaining safe working conditions for all employees engaged in the installation, operation, maintenance or repair of lightwave transmission systems. Specific responsibilities include:

(a) Maintaining a work environment that assures safe and healthful conditions for employees.

(b) Ensuring that all employees working with lightwave transmission systems or scheduled to attend company schools for lightwave systems training are included in the Medical Surveillance Program described in Part 5.

(c) Instructing employees periodically on the precautions, procedures and practices that are applicable to lightwave transmission systems.

(d) Ensuring, insofar as possible, that lightwave transmission systems and any associated test equipment are properly operated and controlled to protect transient or uninformed personnel.

(e) Ensure access covers are closed and secured during normal operation, and when installation or maintenance work is completed. Ensure all unterminated connections are protected and capped.

3.04 Employee Responsibilities

Each employee engaged in the installation, operation, maintenance or repair of lightwave transmission systems is responsible for:

(a) Observing all rules, procedures and practices established for the safe operation of these systems.

(b) Notifying supervision immediately of conditions or practices that have the potential to cause personal injury or property damage.

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(c) Reporting immediately to supervision any known or suspected abnormal exposure to laser radiation. (See Part 4 for normal procedures.)

3.05 Medical Department

The Company Medical Director is responsible for initiating and conducting a medical surveillance program (See Part 5) for employees engaged in the installation, operation, maintenance or repair of lightwave transmission systems. Specific responsibilities include:

(a) Recommending the placement only of those employees whose physical health meets minimum requirements for work with lightwave transmission systems (See Part 6.).

(b) Examining, or arranging for the examination of those employees required to have medical examinations. (See Paragraph 5.)

(c) Maintaining all records specified in Part 8 of this section.

4. SPECIFIC CONTROL MEASURES

4.01 Under normal operating conditions lightwave transmission systems are completely enclosed and the following precautions should be observed:

(a) Employees should not disconnect any lightguide cable and stare into the optical connector terminating the cable because of the potential for eye damage.

(b) Because staring into an energized cable or connector with an optical instrument (e.g., a magnifying glass, microscope, eye loupe, etc., but not corrective eyewear or an indirect image converter such as the Find-R-Scope, see part 10 of this section) increases the risk of eye damage, appropriate labels must be located on the front and back cover of the equipment units in plain view. The wording of the labels shall contain the following words, provided on company standard labels:

NOTICE
UNTERMINATED OPTICAL CONNECTORS MAY
EMIT LASER RADIATION
DO NOT VIEW BEAM WITH OPTICAL INSTRUMENTS

(SEE EXHIBIT 6)

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For Lightwave Transmission Systems utilizing Class III-B laser transmitters, Federal Regulations require the manufacturer to place labels on the front and back, inside the equipment units near each connector field with the following words:

DANGER
INVISIBLE LASER RADIATION WHEN OPEN
Avoid Direct Exposure to the Beam.

(SEE EXHIBIT 6)

(c) The NOTICE sign shall be produced locally in company standard sizes. (See Exhibit 2.)

(d) In addition, a NOTICE label is required on all splice points, i.e., splice organizer, inner closure, etc., and on all test sets that utilize a Class I semiconductor laser.

4.02 Under installation, servicing, or maintenance conditions, lightwave transmission systems can no longer be considered as enclosed. Under these conditions the following practices should be followed:

(a) Only authorized trained personnel shall be permitted to install or perform service and maintenance on lightwave transmission systems and considerable effort should be taken to avoid exposing the eye to emissions from unterminated energized optical connectors at close distances. The connectors associated with lightwave regenerators are recessed, thereby limiting the exposure distance, so that the regenerators may be removed or replaced without fear of eye injury. However, personnel performing the removal or replacement should not stare or look directly into the vacant regenerator slot with optical instruments or magnifying lenses.

(b) Only authorized trained personnel shall be permitted to use lightwave test equipment during installation and/or servicing since this equipment contains semiconductor lasers.

(c) All unauthorized personnel shall be excluded from the immediate area of lightwave transmission systems during installation and servicing when there is a possibility that these systems may become energized.

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4.03 In case of an accidental break in the lightguide cable, or accidental removal of a lightguide cable from its normal position, the following steps should be followed:

(a) By other than trained installation and/or service personnel:

(1) Do not examine or stare into broken, severed or disconnected lightguide cables. (Although the NOTICE shown in 4.01(b) clearly defines the hazard associated with the lightwave transmission systems and specifies appropriate safety precautions, all unnecessary exposure of the eye to lightwave emission should be avoided.)

(2) Contact supervisor to arrange for trained personnel to repair or replace cables.

(b) By trained installation and/or service personnel:

(1) Report problem to supervisor.

(2) Do not view broken cables with any optical instruments other than an indirect image converter such as the Find-R-Scope, unless it has been verified that all lightwave emission has been turned off as specified in SWBT procedures for lightwave systems. See part 10 of this section for guidelines to be used until a filtered eye loupe or longer wavelength Find-R-Scope is made available.

(3) During all splicing operations that require viewing the end of the fiber, it is mandatory that all lightwave sources on the fiber involved be de-energized.

5. MEDICAL SURVEILLANCE

5.01 Personnel assigned to work routinely on lightwave transmission systems (lightwave personnel) and whose job function requires that they disconnect optical connectors on energized fibers, or use optical test equipment such as the loss test set or optical time domain reflectometer, or engage in lightguide splicing operations where there is a possibility that the fiber(s) may be active, may be included in a medical surveillance program.

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The purposes of this program are: To establish a baseline of ocular conditions against which any suspected damage can be measured in the event of accidental exposure to lightwave emission; to detect and document potential lightwave related ocular damage as soon as possible; to identify those personnel who may be at special risk from exposure to lightwave emissions.

5.02 Employees who work in the general vicinity of lightwave transmission systems, but who have no occasion to come in contact with these systems, should not be included in the medical surveillance program.

6. MEDICAL EXAMINATIONS

6.01 Employees classified as lightwave Personnel shall have a baseline eye examination before starting work on the lightwave system. This eye examination shall be as follows:

(a) Ocular History

The employee's past eye history and family history are reviewed. Any current complaints which the employee now has about his/her eyes are noted. Inquiry should be made into the employee's general health status with a special emphasis upon diseases which might produce ocular problems. The employee's present lens prescription and the date of the most recent prescription should be recorded.

(b) Examination of the Ocular Fundus with an Ophthalmoscope

In the recording of this portion of the examination, the points to be covered are: The presence or absence of opacities in the media; the sharpness of outline of the optic disc; the color of the optic disc; the depth of the physiological cup, if present; the ratio of the size of the retinal veins to that of the retinal arteries; the presence or absence of a well-defined macula and the presence or absence of a foveal reflex; and any retinal pathology that can be seen with an ophthalmoscope (hyper-pigmentation, depigmentation, retinal degeneration, exudates). Even small deviations from normal should be described and carefully localized.

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(c) Visual Acuity

Visual acuity for far and near vision should be measured on an apparatus, such as Orthorator, Vision Tester, Sight Screener or Snellen chart and an appropriate vision reading card. (Near Vision Reading Cards are available from major optical manufacturing or supply companies and should be used according to directions.) Notation should be made of the apparatus/card used. If visual acuity is found to be 20/20 in each eye for far and near, corrected with lenses if worn, no further examination is required.

If the visual acuity corrected is less than 20/20 in either eye for far vision using the apparatus listed above, an examination using the Snellen chart at 20 feet should be done. Each eye must be tested individually with the contracteral eye completely occluded. The results based on the Snellen chart should be taken as the final evaluation. If the visual acuity corrected is found to be less than 20/20, an ophthalmological consultation should be obtained.

If the visual acuity in either eye for near vision corrected using the apparatus listed above is less than a Jaeger equivalent of 1, or Snellen 20/20, an examination using an appropriate near vision card should be done. The results of the vision card should be taken as the final evaluation. If the visual acuity corrected is found to be less than a Jaeger equivalent of 1, or Snellen 20/20, an ophthalmological consultation should be obtained.

The ophthalmological consultation should include manifest refraction and a slit lamp examination. Fundus photography is not required.

6.02 The medical examination will be documented on Form SW 1728 or equivalent. This form supercedes Form MO52. It is available through the state safety organization. (See Exhibit 3).

7. FREQUENCY OF MEDICAL EXAMINATIONS

7.01 Lightwave personnel shall be examined: Prior to work with lightwave transmission systems; immediately after a suspected abnormal exposure of the eye, or for specific eye complaints on an individual basis.

Periodic examinations are not required by may be offered in special circumstances.

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8. RECORDS AND RECORD RETENTION

8.01 Complete and accurate records of all medical examinations (including specific test results) shall be maintained for each employee included in the medical surveillance program. Records should be retained for at least 30 years.

9. ACCESS TO RECORDS

9.01 The results of medical examinations should be discussed with the employee.

9.02 All nonpersonally identifiable records of the medical examinations required in Section 4 of these guidelines shall be made available on written request to authorized physicians and medical consultants, and upon the request of an employee or former employee, to his or her physician.

10. GUIDELINES TO SHORT WAVELENGTH VERIFICATION

10.01 The present Find-R-Scope in general use in the field was not designed to detect light emission in the long wavelength region (greater than 1.2 microns) from either an LED or Laser. Thus the absence of light detection with the Find-R-Scope does not verify that long wavelength lightwave emission is not present.

10.02 Since certain construction and maintenance operations require looking at de-energized fibers or connectors with eye loupes, a positive procedure is necessary to ensure the absence of long wavelength light.

10.03 Until a filtered eye loupe or wider wavelength Find-R-Scope is available, the following guidelines should be followed.

(a) During construction of a system, when no single fiber jumpers or plug-in equipment is present, use only a 0.82 micron OLTS and Find-R-Scope for continuity or broken fiber checks.

(b) During loss measurements of a span, insure that no splicing operations are being performed and that no one at the terminals is using any optical instruments. Maintain positive communications between the terminals under test during the measurements.

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(c) During maintenance or restoration activities or whenever energized Lasers or LEDs are present use the following routine:

(1) Establish communications - terminals to splice location.

(2) Verify at the terminals that the fibers or ribbons to be worked on do not have equipment connected.

(3) Using a 0.82 micron OLTS at the terminal and a Find-R-Scope at the splice, check fiber and ribbon identity.

(4) After identification, remove the OLTS source and notify the splicer.

(5) The splicer checks once more with Find-R-Scope to ensure that the OLTS is removed.

(6) If no light is detected in (5) splicer may examine the fiber(s) with an eye loupe.

(7) Splicer notifies terminal and when examinations are completed.

(8) Should terminal end be left unattended by craft during field work, ribbons or fibers being worked on shall be tagged at the terminal to prevent inadvertent connection of light sources. A sample tag is shown. (Exhibit 4).

11. PERIODIC SAFETY REVIEW CHECKLIST FOR LIGHTWAVE TRANSMISSION SYSTEMS, FORM SW 1730 revised 1-85. (See Exhibit 5).

11.01 Form SW 1730 will be used by General Headquarters and State Safety staffs in conducting safety reviews of all the segments involved in LTS installations. This form will also be made available, through State Safety Staffs to the field forces. Network managers are encouraged to utilize this form to conduct their own local reviews.

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EXHIBIT 1

CURRENT STATE REGULATION

Alaska	Dept. Envir. Conser.	Title 18, Art 7 & 8	10/71
Georgia	Dept. Health	Ch 270-5-27	9/1/71
Illinois	Dept. Pub. Health	Registration Law	8/11/67
Massachusetts	Dept. Pub. Health	Sect. 51, Ch 111	10/7/10
New York	Dept. Labor	Code Rule 50	8/1/72
Pennsylvania	Dept. Envir. Resour.	Ch 203, Title 25, Part 1	11/1/71
Texas	Dept. Health	Radiation Control Act Parts 50, 60, 70	7/2/74
	States with existing regulations-or voluntary regulations with no registration requirement		
Missouri	Dept. Health	Existing Ionizing Regulation applies	
Montana*	Dept. Health & Envir. Sciences	Reg: 92-003	
Virginia	Dept. health	Voluntary Program	
Washington	Dept. Lab. & Ind.	Ch 296-62-WAC	
	States with enabling legislation passed		
Arizona*		HB-5	8/11/70
Arkansas*	Public Health	Act 460	
Florida*	Div. Health	ch 501-122	
Louisana*	Div. Radiation Control	HB-1165	7/31/68
Mississippi*	Dept. Health	HB-499	4/24/64
Oklahoma*	Health Dept.	HB-1405	4/14/69
	States with existing OSHA-State agreement[1]		
California	Labor Dept.	OSHA State	
Colorado	Labor Dept.	OSHA State	
Connecticut	Labor Dept.	OSHA State	
Minnesota	Labor Dept.	OSHA State	
North Carolina	Labor Dept.	OSHA State	

* New Regulations now being drafted or pending passage.
1. Not covered by other standards at state level.
2. Enabling legislation not passed.
3. Table I adapted from: Rockwell, R.J. Jr., "Current Status or State Laser Safety Regulation, Report from LIA Laser Safety Committee: Laser Institute of America News, April, 1975.

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EXHIBIT 1

CURRENT STATE REGULATION
(Continued)

States drafting-or awaiting passage of regulations[2]

Alabama		Pending
Iowa		Pending
Maine	Health Eng.	Pending
Michigan		Pending
Nebraska		Pending
New Hampshire		Pending
New Mexico	Envir. Impvt. Agency	Pending
Oregon	Health Division	Pending
Wyoming	Div. Health	

* New Regulations now being drafted or pending passage.
1. Not covered by other standards at state level.
2. Enabling legislation not passed.
3. Table I adapted from: Rockwell, R.J. Jr., "Current Status or State Laser Safety Regulation, Report from LIA Laser Safety Committee: Laser Institute of America News, April, 1975.

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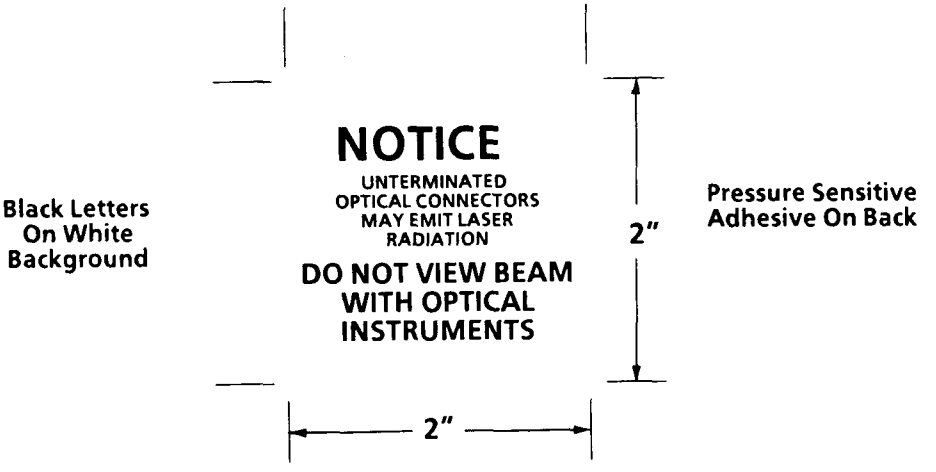
EXHIBIT 2

LASER RADIATION NOTICE LABEL



* LASER RADIATION DANGER LABELS

DANGER
INVISIBLE LASER RADIATION WHEN OPEN.
AVOID DIRECT EXPOSURE TO BEAM

* Danger labels to be placed by manufacturer on class III-b equipment only.

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EXHIBIT 3

Southwestern Bell Telephone

SW-1728 (1-85)

Retain 30 years, until_____

Fiber Optic Eye Examination Report

Check Appropriate Boxes:

☐ Lightwave Personnel ☐ Initial Exam ☐ Follow-Up Exam

Employee Name _____ (Last / First / Middle) Date of Birth _____ Employee Soc. Sec. No. _____

Employee Co. Location _____ Job Function Code _____

Employee's Supervisor _____ Telephone Number _____

Supervisor Co. Location _____ Examination Date _____

History

1. Have you ever, or do you now wear glasses? No ☐ Yes ☐
   Contact lenses? No ☐ Yes ☐
   Present lens prescription (if applicable) _____

2. In your family, is there any history of blindness? No ☐ Yes ☐
   Diabetes? No ☐ Yes ☐ Eye Disease? No ☐ Yes ☐
   Explain _____

3. To the best of your knowledge, have you ever had, or do you now have:

	No	Yes		No	Yes
a. Eye problems			g. Glaucoma		
b. Cataracts			h. Eye operation		
c. Double or blurred vision			i. Headaches		
d. Problems with			j. High blood pressure		
1. Bright lights					
2. Seeing halos around lights			k. Diabetes		
e. Conjunctivitis ("Pink")			l. Hayfever/Allergies		
f. Injury to the eye(s)			m. Other		

4. If you answer yes to any of the above, identify by letter and explain _____

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5. Are you taking any medication at the present time? No ☐ Yes ☐

If yes, please describe _____

Examination

Visual Acuity

Far (Snellen)	Both	Right	Left
Without Glasses			
With Glasses			
Near (Jaeger)	**Both**	**Right**	**Left**
Without Glasses			
With Glasses			
Tonometry	XXXX		

Funduscopic Exam (using a mydriatic; e.g. Paredrine 1%)

	Normal	Abnormal	Details (If abnormal)
Optic Disk Sharpness Of Outline			
Color			
Depth Of Physiological Cup			
Retinal Artery/Retinal Vein Ratio			
Macula (well-defined)			

	Present	Absent	Details (If abnormal)
Media Opacities			
Foveal Reflex			
Retinal Pathology			

(Please describe) Ex: hyper-pigmentation, depigmentation, retinal degeneration, exudates, and identify those personnel who may be at special risk from exposure to lightwave emmission.

Signature _____ M.D. Date _____

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EXHIBIT 4

SAMPLE TAG

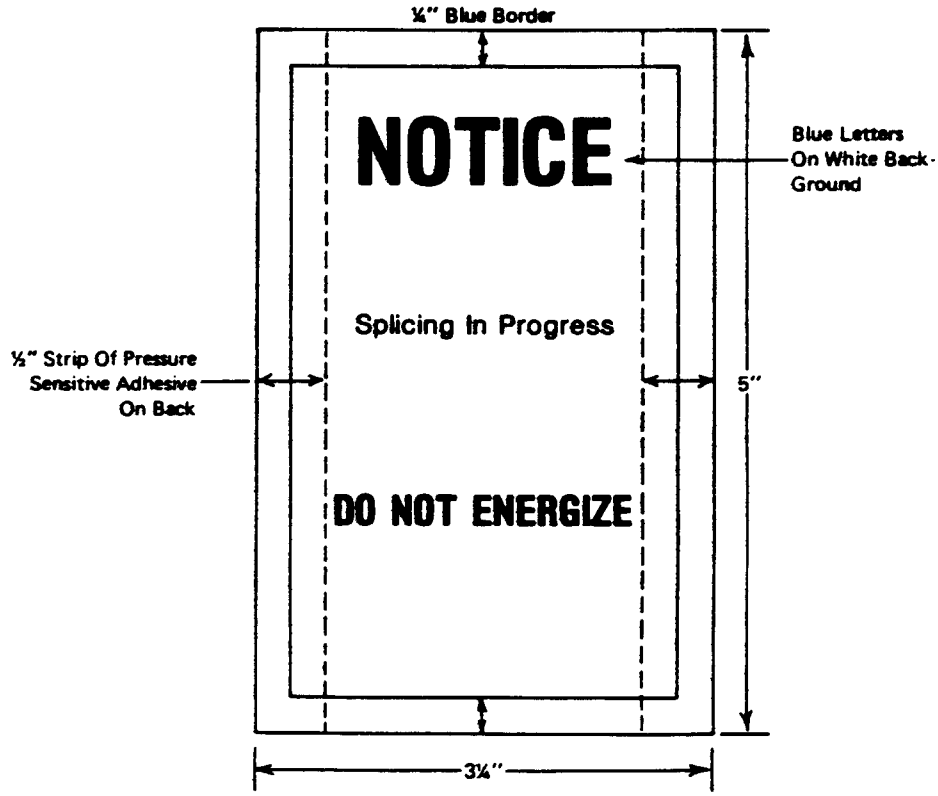

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EXHIBIT 4

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EXHIBIT 5

PERIODIC SAFETY REVIEW CHECKLIST FOR
LIGHTWAVE TRANSMISSION SYSTEMS

Southwestern Bell Telephone

SW-1730
(Rev. 11-88)
Ref: SW 010-110-900

Retain 5 years, until _____

PERIODIC SAFETY REVIEW CHECKLIST FOR LIGHTWAVE TRANSMISSION SYSTEMS

Location _____ State _____ By _____

Location _____ District _____

Location _____ Division _____ Date _____

Force Group _____

	OK	DEV	NA	REMARKS
1. Is access to all LTS termination locations secured? (J.P. 78) (640-252-108,2.02)				
2. Are appropriate labels on correct locations? (Guidelines, 4.01 b)				
A. FRONT & BACK OUTSIDE COVERS: (ALL SYSTEMS) NOTICE UNTERMINATED OPTICAL CONNECTIONS MAY EMIT LASER RADIATION. DO NOT VIEW BEAM WITH OPTICAL INSTRUMENTS.				
B. FRONT & BACK INSIDE EQUIPMENT UNIT: (Class IIi-b only) DANGER INVISIBLE LASER RADIATION WHEN OPEN AVOID DIRECT EXPOSURE TO BEAM				
3. Are access covers to laser transmitter closed and secured during normal operation? (Guidelines, 3.03e)				
4. Are unterminated connections protected? (Guidelines, 3.03e)				
5. Are approved safety glasses worn? (BSP 010-100-005, 5.01)				
6. Does supervisor maintain safe working conditions? (Guidelines, 3.03) (J.P. 28 Pkg. #6 & #12)				
7. Does each employee observe all rules, procedures, and practices established for the safe operation of LTS systems? (Guidelines, 3.04)				
8. Are "Buried Cable" signs evident to protect from damage? (BSP 629-020-005)				
9. Is optical loss test set (OLTS) and optical time domain reflectometer (OTDR) kept under lock? (Guidelines, 2.05)				
10. Do all designed employees (Lightwave Personnel) have a complete Eye Examination Report, form SW-1728 or equivalent, in their medical history file? (Guidelines, 3.05)				

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EXHIBIT 5

ITEM # DATE	EXPLANATION OF DEVIATIONS ACTION TAKEN, TRAINING GIVEN, ETC.	SUPER-VISOR

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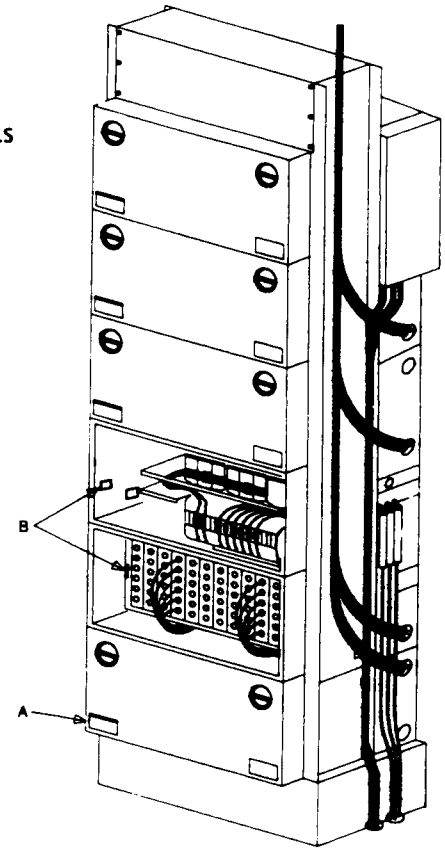
EXHIBIT 6

LEGEND:

A - LASER RADIATION NOTICE LABEL

B - LASER RADIATION DANGER LABELS FOR CLASS III - 6 SYSTEM ONLY



Laser Radiation Label Positioning

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