

Retlif Testing Laboratories

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FCC TEST REPORT FOR OVERHEAD FAULTED CIRCUIT INDICATOR

**Model No. 1548FH-ANC3-R-A-A
FCC ID No. BWN-1548**

**SHOWING COMPLIANCE WITH FCC RULES & REGULATIONS
PART 15, SUBPART C, INTENTIONAL RADIATORS**

Customer Name: Fisher Pierce, Division of Pacific Scientific

Test Procedure: ANSI C63.4:1992

Test Specification: FCC Rules & Regulations Part 15, Subpart C

Date of Report: May 4, 1998

RETLIF Test Report No.: R-3240N

Test Performed By: T. Cricco

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FROM:

**RETLIF TESTING LABORATORIES,
GOFFSTOWN, NH**

Friday, September 11, 1998

J. Monahan

**TO: FCC, COLUMBIA, MD.
ATTENTION: GREG CZUMAK X230**

**REFERENCE FCC ID: BWN-1548
APPLICANT: FISHER-PIERCE
REFERENCE NUMBER 2766**

**Here is some information and additional data in
answer to your request.**

- A. Copy of letter concurring with the use of the device
in emergencies and allowing operation under
sections 15.231 (a)(4) and 2.807(e).**
- B. Data is presented showing time domain plots to
justify the duty cycle factor.**

I hope this information is complete.

**Please contact Retlif Testing Laboratories for any
additional information**


**J. Monahan
Retlif, NH.**

**COVER PLUS 5.
SHEETS**

DUTY CYCLE FACTOR CALCULATIONS
for
FISHER PIERCE Overhead Faulted Circuit Indicator
FCC ID: BWN-1548

The sum of the pulse widths in the 100ms width of the Pulse Train with the highest average value was found by measuring the actual pulse widths and finding the sum, then dividing the sum of the pulse widths by the length of the period.**

The value of the sum of the pulse widths was 49.50 ms.

The length of the period was 100ms

The Duty Cycle equals $49.50 / 100 = .495$

The .495 duty cycle is used to determine the average field strength of emissions observed from the EUT, for comparison to the average detector limit.

**** ANSI C63.4-1992**

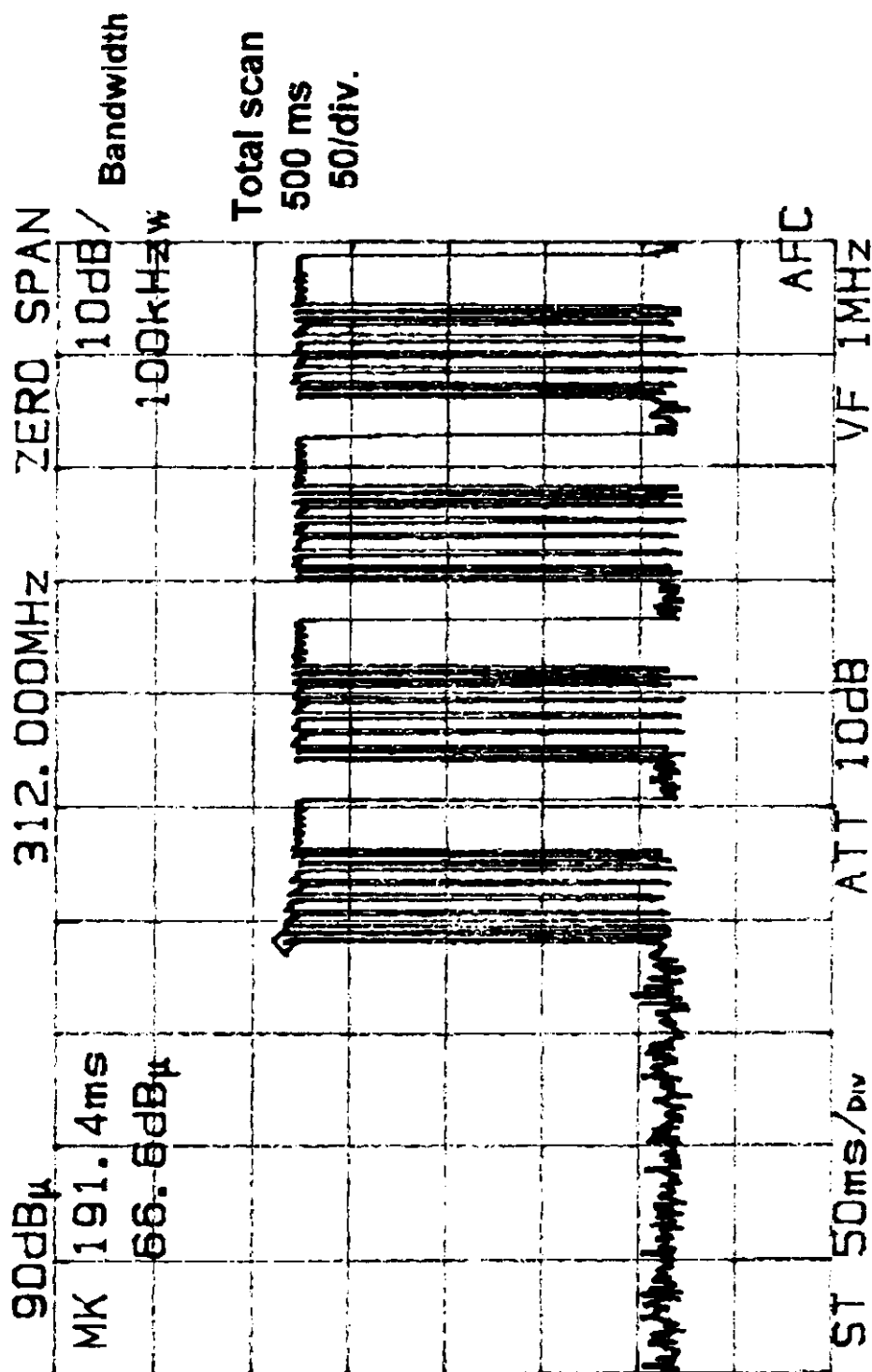


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TIME DOMAIN PLOTS FOR DUTY CYCLE CALCULATIONS



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REFERENCE NUMBER 2766
TIME DOMAIN PLOTS FOR DUTY CYCLE CALCULATIONS

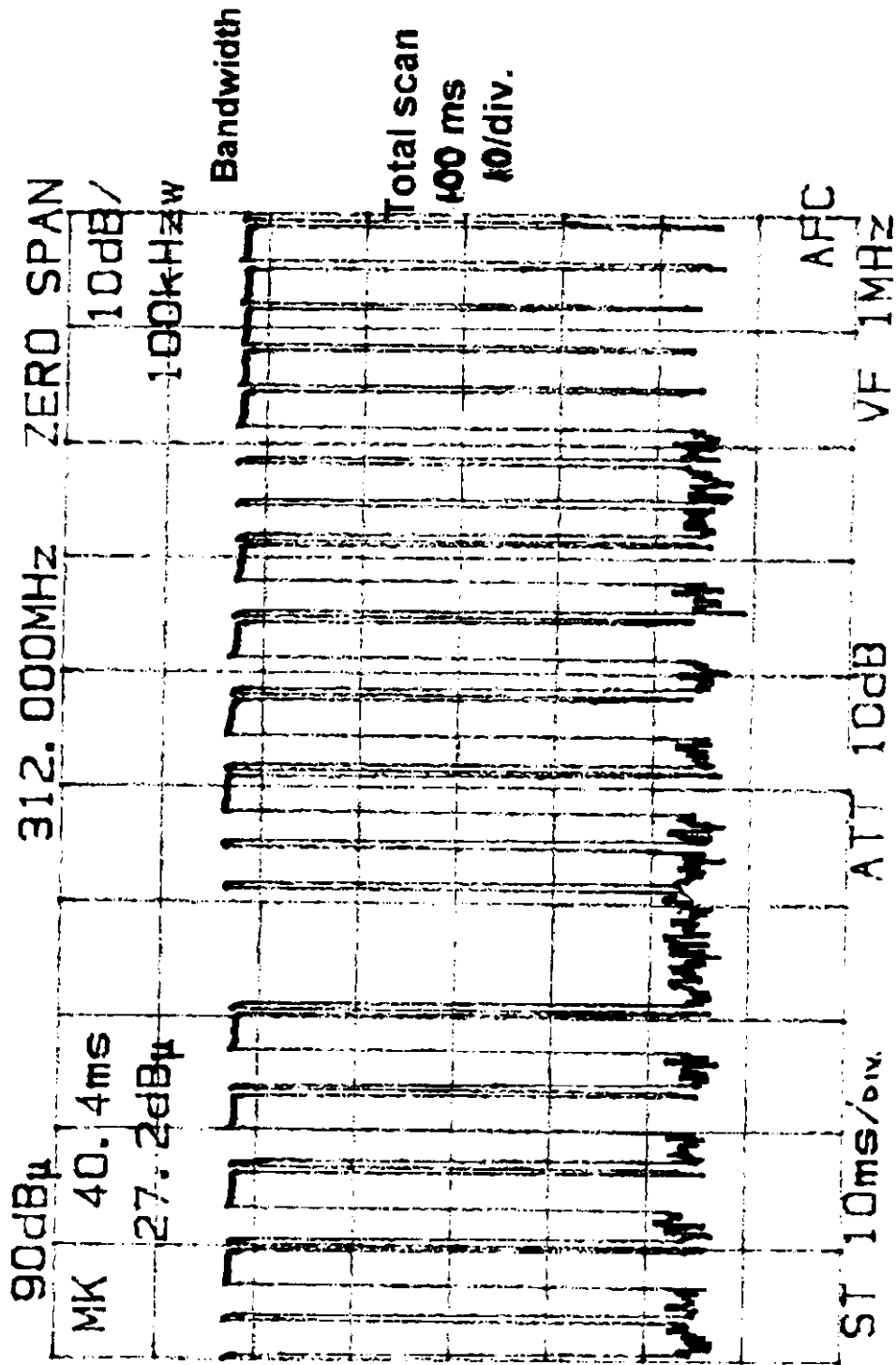


EXHIBIT 4

Report of Measurements



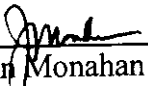
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FCC ID: BWN-1548

CERTIFICATION REQUIREMENTS, SECTION 2.1033, TECHNICAL REPORT

Equipment Manufacturer/Applicant:	Fisher Pierce Division of Pacific Scientific 90 Libbey Parkway Weymouth, MA 02189
Applicable Rules Part:	Part 15, Subpart C
Completed 731 Form:	Accompanying Report
FCC Identifier:	BWN-1548
Operating Instruction Manual:	Exhibit 1
Circuit Description:	Exhibit 2
Block Diagram/Schematic:	Exhibit 3
Report of Measurements	
Test Procedure:	ANSI C63.4:1992
Test Measurement Date:	April 16, 1998
Test Measurement Location:	Retlif Testing Laboratories, Goffstown, NH
Test Sample (EUT):	Overhead Faulted Circuit Indicator
Model Number/Serial Number:	1548FH-ANC3-R-A-A / N/A
Sample Calculations:	On following pages
Photographs of EUT:	Exhibit 5
Peripherals Used:	N/A
Transitional Requirements:	N/A

I HEREBY CERTIFY THAT: The measurements shown here were made in accordance with the applicable procedures. I assume full responsibility for the accuracy and completeness of these measurements and vouch for the qualifications of all persons taking them. On the basis of the measurements made, the device tested has demonstrated compliance with Part 15 of the FCC Rules.


John Monahan
Corporate Engineer



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FCC PART 15, SUBPART C, INTENTIONAL RADIATORS

SECTION 15.231

The EUT is an Overhead Faulted Circuit Indicator with an operating frequency of 312MHz. It was tested to the requirements of FCC, Part 15, Subpart C, Section 15.231. There were no external controls, and the antenna was internal to the case. The EUT had an internal 3.6Vdc Lithium Battery.

SAMPLE CALCULATIONS

A) Duty Cycle/Factor

The duty cycle/factor was derived from measurements of the pulse width and pulse repetition frequency of the EUT, which when combined gave a duty factor of 0.495, which can be multiplied by the emission level in μV to obtain a final reading in $\mu\text{V/M}$. This calculation also equates to a duty factor of -6.1dB, which can be added to readings to obtain a final reading in $\text{dB}\mu\text{V/M}$, for comparison to the specified limit.

The duty cycle/factor was used to adjust the final emission level recorded using a peak detector. The addition of the duty factor compensated for the EUT operation, which was modified for testing to transmit continually, and adjusted the emission level readings for comparison to the limit based on the use of the average detector.

B) Reading with Duty Factor

The reading with duty factor is the final emission level reading in dB, with all measurement factors included and the duty factor added.

Example:	Corrected Reading $\text{dB}\mu\text{V/M}$	=	Meter Reading $\text{dB}\mu\text{V}$	+	Measurement Factor dB	+	Duty Factor dB
	73.6	=	82.0	+	(-2.3)	+	(-6.1)



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C) Converted Reading with Duty Factor

The converted reading with duty factor is the reading with duty factor in $\text{dB}\mu\text{V/M}$ converted to $\mu\text{V/M}$ for comparison to the limit given in $\mu\text{V/M}$.

Example:

Reading with Duty Factor $\text{dB}\mu\text{V/M}$	\Rightarrow	Conversion for ($\text{dB}\mu\text{V/M}$)
$\frac{73.6}{}$		$\frac{20}{}$

Example:

Reading with Duty Factor $\text{dB}\mu\text{V/M}$	\Rightarrow	Conversion Formula	=	Converted Reading with Duty Factor
$\frac{73.6}{}$		$\text{Log} \left[\frac{-\text{dB}\mu\text{V}}{20} \right]$		$\frac{4786.3\mu\text{V/M}}{}$

D) Detector Functions

The Radiated Emissions of the EUT were measured in Peak Detector Mode. The emission levels observed from the EUT were adjusted with the Duty Cycle Factor before comparison to the specified limit. The spectrum was investigated from 30MHz to 3.2GHz. No emissions from the EUT were observed within 20dB below the specified limit in the frequency range of 30MHz to 300MHz. No Conducted Emissions testing was required on the battery operated EUT.

E) Restricted Bands of Operation

No emissions from the EUT appearing within the restricted frequency bands exceed the specified limits. Where required, the limits used on the emissions data in this report reflect the adjusted limit for restricted bands.



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Test Procedure

The test procedure follows the guidelines specified in the applicable FCC and ANSI specifications and general industry practices. Although test procedures may sometimes have to be modified to address the needs of specific test samples, the following general test procedure is the basis for any testing program:

Radiated Emissions - Radiated emissions testing is performed over the frequency range of 30MHz to the specified range per the standard, on the Open Area Test Site. The EUT is set up on a nonmetallic test stand with a remote controlled turntable. A spectrum analyzer is connected to the measurement antenna, which is mounted on a remote controlled four meter tall antenna mast. The frequency range is scanned and each EUT emission observed is maximized by: (1) Raising and lowering the measurement antenna. (2) Rotating the measurement antenna to both the horizontal and vertical polarizations, and (3) Rotating the test stand. The maximized emissions observed from the EUT that are within 10dB below the specified limit are recorded.



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RADIATED EMISSIONS EQUIPMENT LIST

EN	Model No.	Type	Manufacturer	Frequency Range	Serial No.	Cal Date	Due Date
3118	BPA-1000	Pre-AMPLIFIER	Electro-Metrics	10kHz - 1000MHz	139	07/10/97	07/10/98
3257	3146	Log Periodic Antenna	Electro-Mechanics	200MHz-1000MHz	1379	04/03/98	04/03/99
3258	3115	Double Ridge Guide Antenn	Electro-Mechanics Co.	1GHz-18GHz	2438	04/03/98	04/03/99
4002	3109	High Field Biconical	Emco	30MHz - 200MHz	2171	01/06/98	01/06/99
4201	3143	Biconilog Antenna	EMCO	26MHz-1.1GHz	9612-1330	12/03/96	06/03/98
4895	8593EM	Spectrum Analyzer	Hewlett Packard	9 kHz - 22 GHz	3624A00162	08/07/97	08/07/98
4896	7470A	Plotter	Hewlett Packard	N/A	2308A67727	08/22/97	08/22/98



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TABULAR DATA SHEET

R-3240N FISHER FCC15-C RE TC 3M MKR 312.035 MHz
 REF 95.0 dBμV AT 10 dB 85.06 dBμV

PEAK
 LOG
 10
 dB/

-20 dB
 FROM PEAK

MARKER
 312.035 MHz
 85.06 dBμV

WA SB
 SC FC
 CORR

CENTER 312.040 MHz
 #RES BW 120 KHz

VBW 300 KHz
 SWP 20.0 msec

SPAN 2.000 MHz

OCCUPIED BANDWIDTH

Center
 Frequency: 312.0 MHz
 Bandwidth = .25%
 of Center Freq.
 MAX.
 Bandwidth = .780 MHz
 at 20dB down

DATA GRAPH

Horizontal Scale
 Span = 2.0 MHz
 = 200 kHz/DIV.

Vertical Scale
 10 dBuV/DIV.

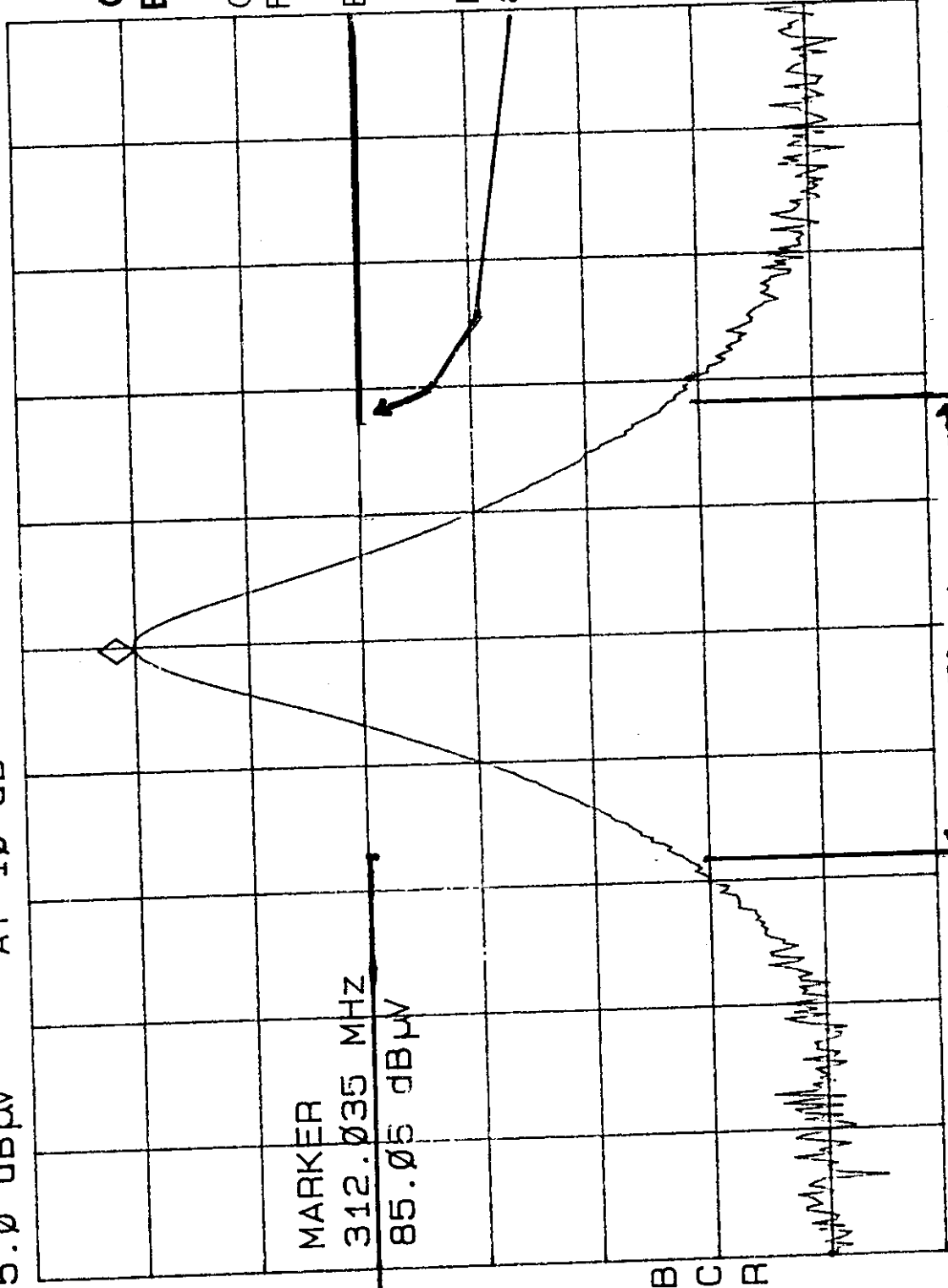


EXHIBIT 5

Equipment Photographs and Label



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