

July 13, 1999

Federal Communications Commission
7435 Oakland Mills Road
Columbia, MD 21046

ATTN: George Tannahill

RE: ~~Control Chief Corp., Certification Application;~~
FCCID: CBFTCT1-450; EA94148

Dear George:

This is in response to your FAX of 7/8/99.

- 1. Internal photos enclosed.
- 2. External photos enclosed.
- 3. Section 90.214 Data enclosed.
- 4. We agree to correct equipment class to TNB.
- 5. The user cannot change the bit rate of 2400 bps for this product. However, the transmitter module has the capability to increase the data rate to 9600 bps in order to comply with Section 90.203j(3) spectrum efficiency standard. This could be done in production if required by FCC. Section 4.2.5 of the Theory of Operation explains this method. But normally there is no need to use a higher bit rate for this product.
- 6. We agree to use 100 Hz resolution bandwidth for occupied bandwidth plots.
- 7. The F1D designator is correct since this product uses FM modulation of a single carrier with data transmission.

Your consideration is much appreciated.

Sincerely,


Steven Dayhoff
Chief Engineer

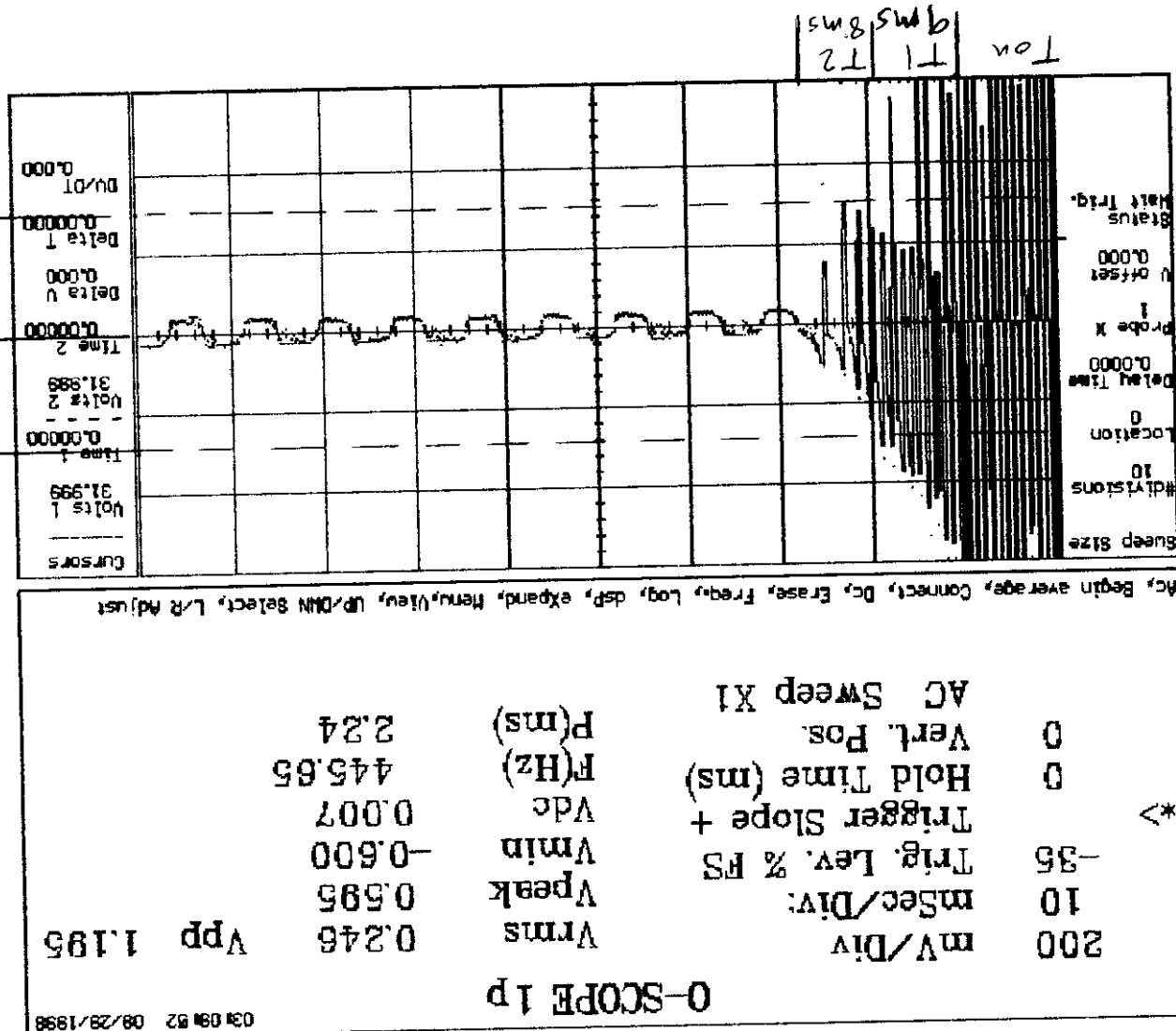
8370 Court Avenue, Suite B-1 • Ellicott City, Maryland 21043 • Phone/FAX (410) 461-5548

TRANSIENT FREQUENCY BEHAVIOR - 90.214

TEST PROCEDURE: EIA/TSB 102

1. Using the variable attenuator, the transmitter level was set to 40 dB below the modulation analyzer maximum input level, then the transmitter was turned off.
2. With the transmitter off, the signal generator was set 20 dB below the level of the transmitter in the above step, and maintained during the test.
3. Attenuation between the transmitter and the RF detector was reduced by 30 dB.
4. The transient frequency behavior was observed and plotted.

$T_2 \text{ Limit} = 25\text{ms}$
 $T_1 \text{ Limit} = 10\text{ms}$

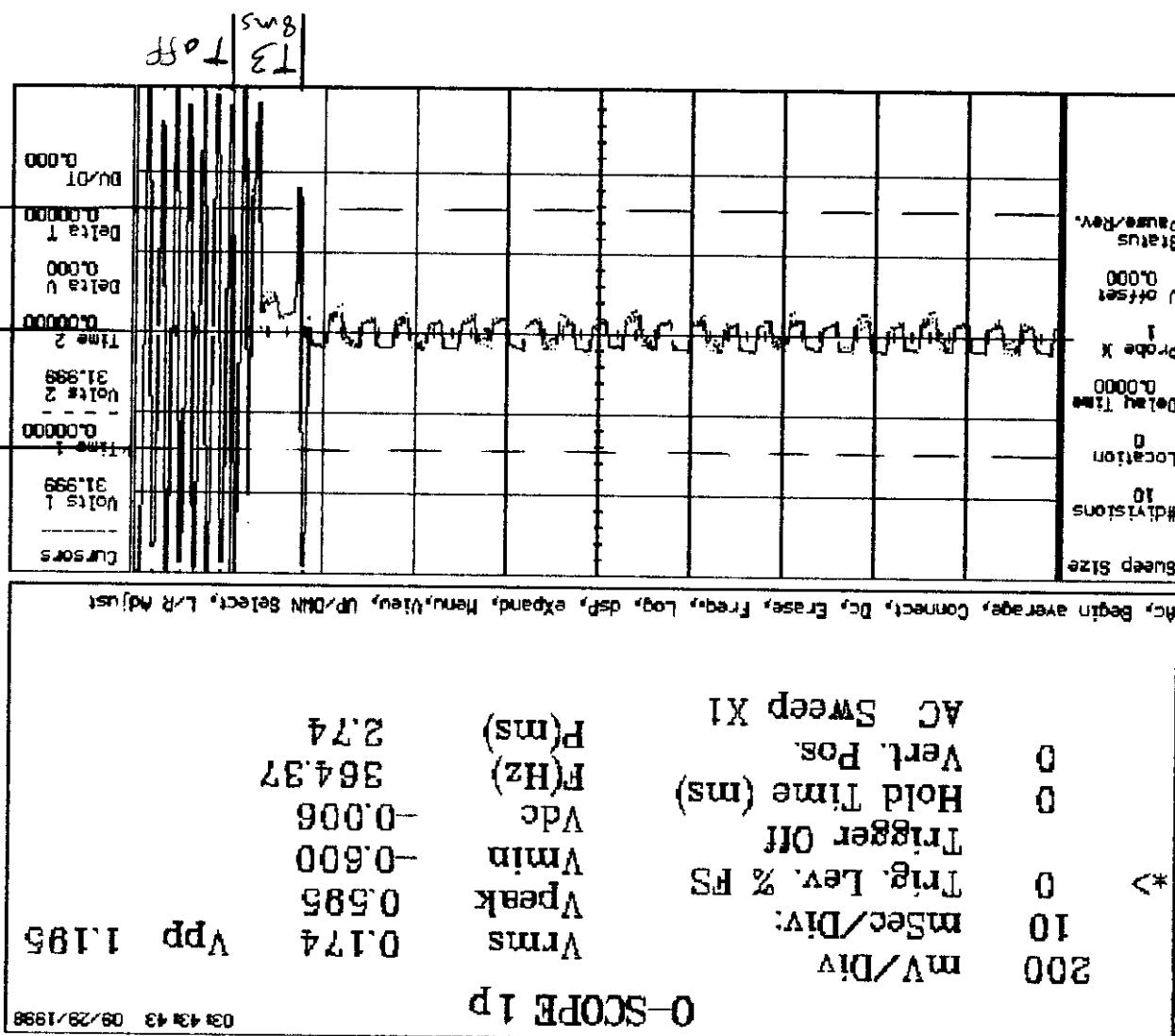


TRANSIENT FREQUENCY BEHAVIOR - 90.214

CONTROL CHIEF CORP.

FCCID: CBTCT1-450

$$T_3 \text{ Limit} = 10 \text{ ms}$$



TRANSIENT FREQUENCY BEHAVIOR - 90-214

CONTROL, CHIEF CORP. BCCID: CBFCTCL-450

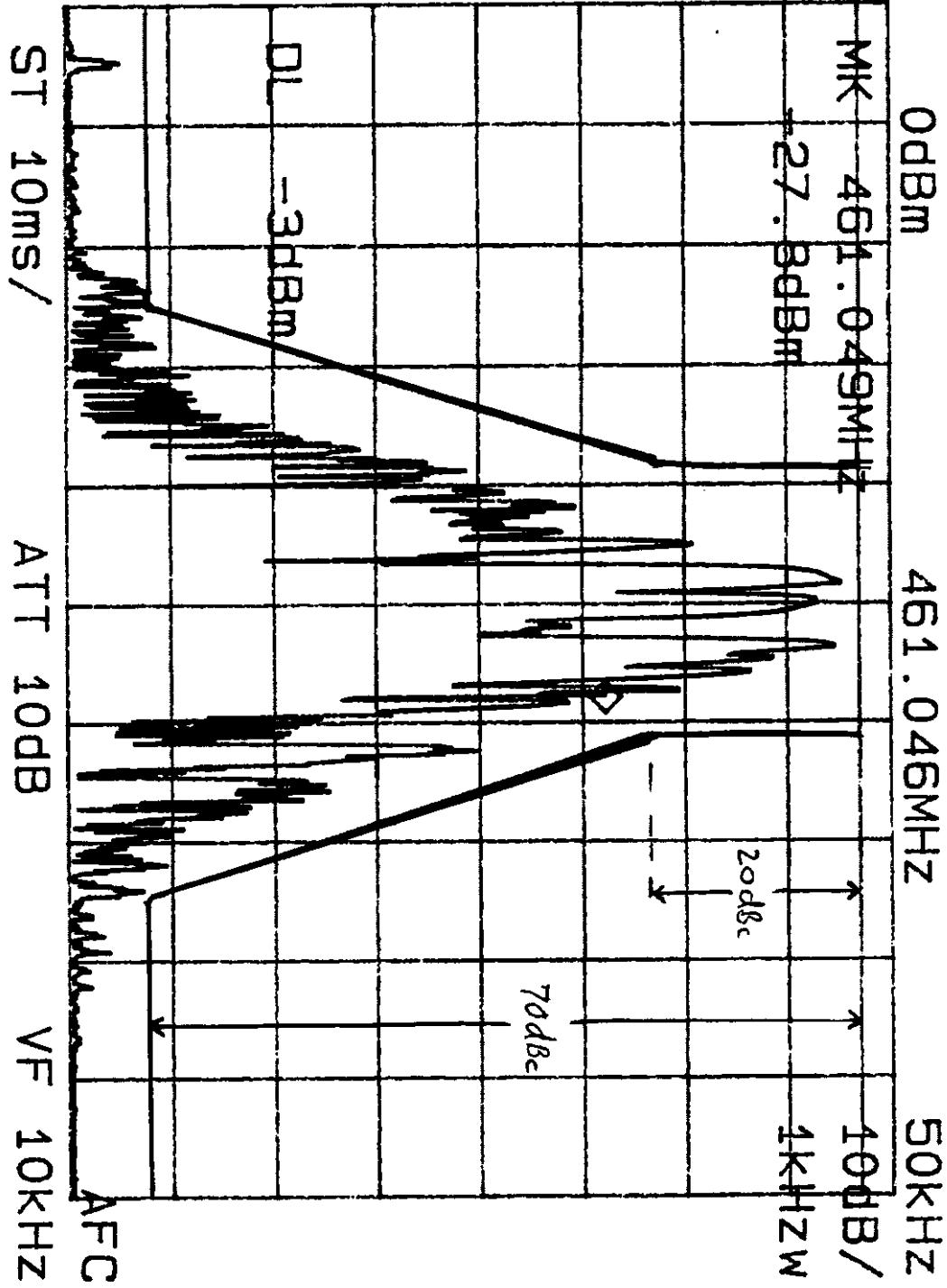
OCCUPIED BANDWIDTH - EMISSION MASK D FOR 12.5 KHZ CHANNEL

MODULATED

50 KHZ SPAN

1 KHZ RES. BW

NOTE: 30 dB
EXT. ATT.



4.2.4 Communication Data Protocol

The Communication Protocol will define the Transmission Mode, Control Procedure, and Recovery Procedure.

The radio module will accept serial TTL data directly at its DMOD pin at a specified frequency response of 9Hz to 3KHz. The communication interface card provides the buffering between Radio Module and Logic module. The data to be transmitted originates at the Logic Module. The control signals are shown in figure 3. The table below lists the parameters of the Physical Layer.

Table 1 Physical Layer Characteristics

Characteristic	Description
Transmission Type	Asynchronous
Transmission Mode	Digital – FSK (Frequency Shift Keying)
Channel Spacing	12.5KHz
Data Rate	2400 bps
Data Stream Format	Asynchronous serial NRZ-C (1-Start, 8-Data, 2-Stop)
Acquisition	Data stream processing qualified by Squelch Input. Preamble provides stabilization time and Start of Packet indicator.
Preamble	Provides stabilization at the receiver analog audio data.
Synch	A unique bit sequence to qualify the start of the packet.

4.2.5 Spectrum Efficiency

Regarding the "Bandwidth Efficiency Requirement" of the CFR 47, paragraph 90.209. The data rate specified above of 2400 bps is the typical data rate to be utilized in the majority of applications for this product. If an application were to require a higher data rate the deviation would be adjusted accordingly to maintain the occupied bandwidth as specified in the paragraph 90.209. For example, if the data rate were to increase to 9600 bps the deviation would be reduced from 1.2KHz to 800Hz. This adjustment would be accomplished per the Radio module's manufacturer's test procedure, SX450 OVERALL TEST PROCEDURE.

6 NY

data?

From: OET
To: stevend@columbia.aim-smart.com
Subject:
Date: Thursday, July 08, 1999 13:37:52

To: Steven Dayhoff, National Certification Laboratory
From: George Tannahill
gtannahill@fcc.gov
FCC Application Processing Branch

Re: FCC ID CBFTCT1-450
Applicant: Control Chief Corporation
Correspondence Reference Number: 8651
731 Confirmation Number: EA94148
Date of Original E-Mail: 07/08/1999

1. Please provide internal photos of the device.
2. The external photo only shows a top front view. Please provide photos of the rest of the external views of the device. *Applying F1D, Time frames not properly drawn* *Not 9ms*
3. Please provide 90.214 data. *Not clear if consider F1D* *Not 8ms*
4. The 731 form requests the equipment class DSR. DSR is for Part 15 remote control security transmitters only and not Part 90 equipment. The correct equipment class for this device is TNB.
5. Section 4.2.5 of the Theory of operation appears to indicate that the bit rate of this device can be increased. Please clarify if this is correct, what the maximum bit rate is, and provide bandwidth plots at the maximum bit rate. *Is it in Manual - No - Tell them grant will only cover 2400L operation*
6. On future applications for the occupied bandwidth plots the rules require a 100 Hz resolution bandwidth. Also, normally to provide a more accurate indication of the emission spectrum of the device, the peak hold feature of the analyzer is used and the sweep is increased. Please do this in the future.
7. Please justify the requested emission designator of F1D. Clearly state why it is the correct designator. *Low is it modulated, what is modulation phase* *1 is 0*

The items indicated above must be submitted before processing can continue on the above referenced application. Failure to provide the requested information within 60 days of the original e-mail date may result in application dismissal pursuant to Section 2.917 (c) and forfeiture of the filing fee pursuant to section 1.1108.

DO NOT reply to this e-mail by using the Reply button. In order for your response to be processed expeditiously, you must upload your response via the Internet at www.fcc.gov, Electronic Filing, OET Equipment Authorization Electronic Filing. If the response is submitted through Add Attachments, in order to expedite processing, a message which informs the processing staff that a new exhibit has been submitted must also be submitted via Submit Correspondence. Also, please note that partial responses increase processing time and should not be submitted.

Any questions about the content of this correspondence should be directed to the e-mail address listed below the name of the sender.



410 461 5548

Fax

To: George Tannahill
Company: FCC Lab
Fax:

From: Steven Dayhoff

Date: 7/27/99

Subject: Transient Freq. Behavior Plot

Pages: 1

Comments:

For: Control Chief Corp
FCC ID: CBF TCT-450
EA 94148
Correspondence 8917

CONTROL CHIEF CORP.
FCCID: CBFTCT1-450

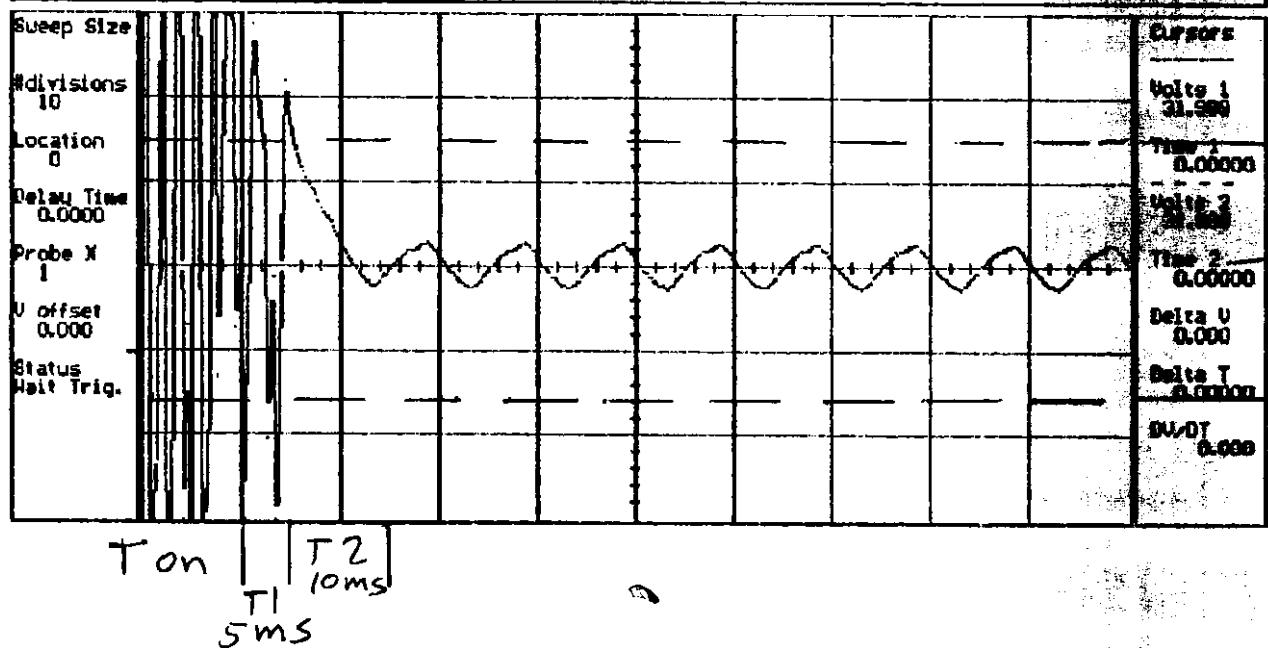
TRANSIENT FREQUENCY BEHAVIOR - 90.214

O-SCOPE 1p

22/03/01 12/23/1998

200	mV/Div	Vrms	0.184	Vpp	1.195
10	mSec/Div:	Vpeak	0.595		
-35	Trig. Lev. % FS	Vmin	-0.600		
*>	Trigger Slope +	Vdc	0.015		
0	Hold Time (ms)	F(Hz)	161.29		
0	Vert. Pos.	P(ms)	6.20		
	AC Sweep X1				

Ac, Begin average, Connect, Dc, Erase, Freq., Log, disp, expand, Menu, View, UP/DWN Select, LR Mute



T₁ Limit = 10 ms

T₂ Limit = 25 ms