DIGITAL TRANSMISSION SYSTEM
828AFXT DIGITAL MULTIPLEXER
THEORY OF OPERATION

1. GENERAL

1.01 This section is a cover sheet for Telco Systems Fiber Optics Corporation Digital Transmission System 828AFXT Digital Multiplexer Theory of Operation. This section is reproduced with permission of Telco Systems Fiber Optics Corporation and is the equivalent of Telco practice 833-102-002, Issue 1.

1.02 Whenever this section is reissued the reason(s) for reissue will be listed in this paragraph.

1.03 This section is an addendum to the 828AF Digital Multiplexer Theory of Operation section (TELC 365-407-850) and contains information regarding circuit modifications which allow extended temperature operation.

1.04 If corrections are required in the attached document, use Form-3973 as described in Section 000-010-015.

1.05 If equipment design and/or manufacturing problems should occur, refer to Section SW 010-522-906 for procedures on filing an Engineering complaint.

2. ORDERING PROCEDURE

2.01 For information concerning equipment and parts availability contact Telco Systems, Order Administration Department, in Norwood, Massachusetts, at:

1-800-44-SALES
1-617-551-0300

2.02 To order additional copies of this practice, use TELC 365-407-854SW as the section number.

3. REPAIR/RETURN

3.01 For defective modules and assemblies contact the Repair and Return Department at the following number:

8:00 a.m. - 5:00 p.m. (617) 551-0300 - Ext. 2778

Attachment: Telco Systems Fiber Optics Corporation

Digital Transmission System
828AFXT Digital Multiplexer
Theory of Operation

TELCO SYSTEMS FIBER OPTICS CORPORATION SECTION 833-102-002
Norwood, Massachusetts 02062 Issue 1, April 1988

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828AFXT DIGITAL MULTIPLEXER
THEORY OF OPERATION

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1. GENERAL

1.01 This section is an addendum to the 828AF Theory of Operation Section (830-102-002) and contains information regarding circuit modifications which allow extended temperature operation.

1.02 Whenever this section is reissued, the reasons for reissue will be listed in this paragraph.

1.03 The 828AFXT multiplexer performs all of the operational functions of the 828AF multiplexer except that the 828AFXT can be utilized in hostile environments, where the ambient temperature is unregulated. The operational range of the 828AFXT multiplexer is as follows:

828AFXT TEMPERATURE RANGE:

-40^{O}F to $+151^{O}$F

-40^{O}C to $+66^{O}$C

1.04 An 828AF can be converted into an 828AFXT capable of extended temperature operation by installing extended temperature cards into the unit. The essential difference between 828AF and 828AFXT circuit cards involves the use of MIL-spec components in critical circuits and a feedback controlled thermocouple heat pump to stabilize laser junction temperatures within the XCVR (Transceiver) card. All extended temperature operation cards are readily identified by an `E' suffix appended to the CCA part number. Any cards which do not contain an `E' suffix, cannot be utilized in 828AFXT applications.

1.05 Since LTU circuit cards are not designed for extended temperature operation, the LTU Theory of Operation subsection (830-100-002C) of the 828AF Operation and Maintenance manual does not apply to the 828AFXT unit. All other circuit cards can be employed

1.06 The basic operational theory of all remaining cards is the same in the 828AFXT as compared to the 828AF multiplexer.

1.07 A complete listing of all circuit cards, accessories, optical patch cords and interconnection cables are listed in the 828AFXT Parts List and Ordering Information Section (833-102-003) of this addendum.

SECTION 833-102-002

2. THEORY OF OPERATION

2.01 The use of MIL-spec components in critical circuits allows the 828AFXT to operate at extended temperature ranges. While 828AFXT circuit cards can be utilized in all 828AF applications, 828AF cards designed for temperature-controlled environments are often more cost effective by comparison.

2.02 Since laser junction temperature is critical to proper laser operation, the XCVR (Transceiver) card employed in the 828AFXT unit is designed with a temperature compensation circuit. A thermistor mounted on the laser dipack monitors laser junction temperature. Thermistor resistance changes are converted into equivalent voltage changes via a dc amplifier. This amplifier controls the voltage applied to a thermocouple mounted on the laser cavity. Changes in ambient temperature alters the heat conduction of the thermocouple and maintains laser junction temperature at $+25^{O}C$.