

DIGITAL FIBER-OPTIC TRANSMISSION SYSTEM
FOX-2 T-HUB
PARTS LIST AND ORDERING INFORMATION

1. GENERAL

- 1.01 This section is a cover sheet for the Telco Systems Fiber Optics Corporation Digital Fiber-Optic Transmission System FOX-2 T-HUB Parts List and Ordering Information. This section is reproduced with permission of Telco Systems Fiber Optics Corporation and is the equivalent of Telco practice 832-100-003, Issue 1.
- 1.02 Whenever this section is reissued the reason(s) for reissue will be listed in this paragraph.
- 1.03 This section presents a parts list for the FOX-2 T-HUB DS-2 Fiber-Optic Transmission System, including required unit hardware, optional equipment, accessories, and cables.
- 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 365-407-863SW 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
PROPRIETARY

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Attachment: Telco Systems Fiber Optics Corporation
Digital Fiber-Optic Transmission System
FOX-2 T-HUB
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2. PARTS LIST.....	3-1	2.04 TABLE D lists all required cables, fiber optic patch cords, and related interfacing hardware which must be ordered to facilitate system integration.
3. ORDERING INFORMATION.....	3-1	2.05 For information pertaining to TELTRAC (Telco Systems Telecommunications Remote Alarm and Control), refer to the TELTRAC Maintenance and Users manuals.
1. SCOPE		3. ORDERING INFORMATION
1.01 This section presents a parts list for the FOX-2 T-HUB DS-2 Fiber Optic Transmission System including required unit hardware, optional equipment, accessories, and cables. In addition, this section also provides general parts ordering information.		3.01 For information regarding the FOX-2 T-HUB equipment and parts availability, contact Telco Systems Order Administration Department, in Norwood, MA:
1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.		1-800-44SALES 617-551-0300
2. PARTS LIST		To expedite processing, all equipment orders must be accompanied by a Sales Order Number number.
2.01 TABLE A provides a list of the basic assemblies and circuit cards required for FOX-2 T-HUB installation.		3.02 Alternatively, a Telco Systems Telephone Equipment Order Form (see Figure 3-1) accompanied by a Purchase Order Number can be sent to the Order Administration Department.
2.02 TABLE B lists all optional equipment for specific system applications.		
2.03 TABLE C lists equipment accesso-		

TABLE A. FOX-2 T-HUB Assembly and Part Number List

DESCRIPTION	PART NUMBER	QUANTITY
1. BASIC EQUIPMENT CONFIGURATION		
The following parts and quantities are required <u>regardless</u> of FOX-2 T-HUB system application.		
UNEQUIPPED CAGE ASSEMBLY	AXX076G1	1 per T-HUB
AIR BAFFLE/FIBER TROUGH	ACX033G1	1 per T-HUB
FUSE AND ALARM PANEL (-48 Vdc)		1 per rack
12 protected power feeds	ACX025G1	
OR		
6 protected power feeds	ACX043G1	
POWER SUPPLY MODULES	PSX016-1	4 per T-HUB
CONTROL MPU CARDS	CCA162G1	2 per T-HUB
B3ZS ENTRANCE LINK (WLEL) CARDS	CCA118G1	2 per T-HUB
DS-3 HIGH SPEED COMMON (HS COM) CARDS	CCA120G1 or G2	2 per T-HUB
2. PRE-EMPHASIS/BUILDOUT NETWORKS & SIP PACKS		
The following modules and quantities are required to maintain industry-standard waveforms and pulse amplitude levels at the DSX-1/1C cross-connect.		
T1 PRE-EMPHASIS/BUILDOUT NETWORKS		1 per T1 LS INT
Cable length to DSX-1 and SIP pack	Buildout:	card as required
0 - 100 feet (RNX003-3)	None req.	
101 - 350 feet (RNX003-2)	CCA062G1	
351 - 655 feet (RNX003-1)	CCA062G2	
T1C PRE-EMPHASIS/BUILDOUT NETWORKS		1 per T1C LS INT
Cable length to DSX-1C and SIP pack	Buildout:	card as required
0 - 100 feet (RNX003-3)	None req.	
101 - 250 feet (RNX003-2)	CCA062G10	
251 - 400 feet (RNX003-2)	CCA062G11	
401 - 550 feet (RNX003-1)	CCA062G12	
551 - 655 feet (RNX003-1)	CCA062G13	

TABLE A. FOX-2 T-HUB Assembly and Part Number List (Cont.)

DESCRIPTION	PART NUMBER	QUANTITY
3. LOW-SPEED/DS-2 OPTICAL INTERFACE		
The following parts must be <u>added</u> to the BASIC EQUIPMENT CONFIGURATION to support each <u>unprotected</u> DS-2 optical span.		
MAIN LTU CARD		
Single-mode optical interface	CCA148G1	1 per span up to 7 max.
OR Multimode optical interface	CCA148G2	
T1 LOW-SPEED INTERFACE CARD [Note 1]		
AMI interface only with preset all ones AIS signal [NOTE 2]	CCA050G1	1 per span up to 7 max.
OR AMI interface with selectable all ones or all zeros AIS [Note 2]	CCA124G1	
OR AMI/B8ZS selectable on a per channel basis [Note 3]	CCA161G2	
OR		
T1C LOW-SPEED INTERFACE CARD [Note 1]	CCA006G1	1 per span up to 7 max.

Note 1: The selection of T1 (1.544 Mb/s) or T1C (3.152 Mb/s) Low-Speed Interface cards is dependent upon the transmission rate of the T-carrier terminal equipment.

Note 2: The term AMI refers to Alternate Mark Inversion T1 bipolar line coding where average ones density and zero code suppression is guaranteed by the T-carrier terminal equipment.

The term AIS refers to Alarm Indication Signal; a "keep-alive" signal which is generated to down-line T-carrier equipment in the event of equipment or span failure.

Note 3: The term B8ZS refers to Bipolar with Eight Zero Substitution T1 line coding which is used in applications where required line activity is maintained by the transmission equipment independent of the informational content of the data channel.

The selection of AMI or B8ZS T1 line coding is dependent upon T-carrier terminal equipment interface.

TABLE B. FOX-2 T-HUB Equipment Options

DESCRIPTION	PART NUMBER	QUANTITY
<p>1. DS-2 OPTICAL INTERFACE PROTECTION</p> <p>The following parts and quantities must be <u>added</u> to the LOW-SPEED/DS-2 OPTICAL INTERFACE equipment list to provide 1:1 protection for each DS-2 optical span.</p> <p>STANDBY LTU CARD [Note 1]</p> <p>Single-mode fiber optic interface OR Multimode fiber optic interface</p>	<p>CCA149G1 CCA149G2</p>	<p>1 per span</p>
<p>2. HIGH SPEED (DS-3) PROTECTION</p> <p>The following parts and quantities must be <u>added</u> to the BASIC EQUIPMENT CONFIGURATION to provide 1:1 protection of the DS-3 interface between the upper and lower shelf units.</p> <p>DS-3 HIGH SPEED COMMON (HS COM) CARDS WIRE LINE ENTRANCE LINK (WLEL) CARDS [Note 2]</p>	<p>CCA120G1 CCA118G1 CCA158G1E</p>	<p>2 per T-HUB 2 per T-HUB 1 per T-HUB</p>
<p>3. REMOTE ALARM CARD II (RAC-II)</p> <p>The optional RAC-II card provides relay contact closures in response to far-end FOX-2/2R external alarm inputs. FOX-2R units must likewise be equipped RAC-II cards to invoke this function.</p>	<p>CCA158G1E</p>	<p>(installed in the upper shelf unit only)</p>
<p>4. OPTIONAL MPU II CARD</p> <p>The Optional MPU II card is used for remote TELTRAC interface to/from far-end FOX-2/2R units and/or to enable RAC-II external alarm input functionality.</p>	<p>CCA135G1</p>	<p>1 per T-HUB (installed in the lower shelf)</p>

Note 1: The Standby LTU card (CCA149G1) is electrically identical to the Main LTU card (CCA148G1) except that each card is the physical mirror image of the other to facilitate fiber interface. Muldem protection is internal to all T1 or T1C Low-Speed Interface cards.

Note 2: Each Wire Line Entrance Link card is equipped with P/N 1070599G1 Buildout module unless otherwise directed.

TABLE C. FOX-2 T-HUB Accessories

DESCRIPTION	PART NUMBER	QUANTITY
<p>1. MANUAL CONTROL INTERFACE CARD</p> <p>This circuit card performs channel loopback, T1/T1C low-speed switching, BPV error-second measurement and LED test.</p>	CCA008G2	
<p>2. MAINTENANCE INTERFACE CARD</p> <p>This card is required for the replacement of all T1/T1C Low-Speed Interface and Control MPU circuit cards.</p> <p>Using this card, an off-line spare Low-Speed Interface card can be tested and replaced without service interruption.</p>	CCA058G1E	
<p>3. T1 MONITOR CARD</p> <p>This card plugs into the bridge slot adjacent to each Low-Speed Interface slot and allows individual T1/T1C channels to be monitored or accessed for T1/T1C testing.</p>	CCA176G1	
<p>4. MAINTENANCE KIT</p> <p>Kit with Maintenance Interface card</p> <p>Kit without Maintenance Interface card</p>	<p>AXX072G1</p> <p>AXX072G6</p>	
<p>5. -48 Vdc FUSE AND RELAY KIT (spare)</p>	AXX004G1	
<p>6. CEV CONVERSION KIT</p> <p>Kit includes BNC bracket and cable support for cable management during CEV installations.</p>	AXX067G1	
<p>7. CEV SHELF KIT</p> <p>Kit includes a shelf to support equipment during CEV installations.</p>	AXX068G1	

TABLE C. FOX-2 T-HUB Accessories (Cont.)

DESCRIPTION	PART NUMBER	QUANTITY
8. ALUMINUM RELAY RACKS		1 per bay as required
7-feet by 23-inches	FAR004-3	
9-feet by 23-inches	FAR004-7	
11.5-feet by 23-inches	FAR004-12	
9. DSX-1/1C CROSS-CONNECT ACCESSORIES		
DSX-1/1C Panel (56 ckt./bantam jacks)	OSX002	1 per 2 T-HUBs
DSX-1/1C Panel (25 ckt./310 jacks)	OSX003	1 per T-HUB
DSX-1/1C Panel (28 ckt./310 jacks)	OSX021	1 per T-HUB
10. FIBER OPTIC INTERFACE PANEL		1 per T-HUB as required
Biconical connectors	ACX003G1	
FC-PC connectors	ACX003G2	
Sleeve and Hardware (Biconical)	AXX003G1	1 per fiber
Sleeve and Hardware (FC-PC)	AXX003G3	1 per fiber
11. FIBER OPTIC ORGANIZER		[Note 1]
12 Fiber Organizer	OSF004	
24 Fiber Organizer	OSF005	
12. MOUNTING HARDWARE		
Standoffs, Nylon with screws	OSH013	As required
13. WIRE-WRAP BLOCK	HTB013-1	
Wire-wrap block (segmented into four 10 x 5 pins) equipped with a 50-pin Amphenol male interface connector		
14. SPARES CARRYING CASE	PKG025G1	1 per kit

Note 1: The quantity and size of the Fiber Optic Organizers used is dependent upon system application, the number of DS-2 optical spans equipped and whether the optical spans are protected.

TABLE D. FOX-2 T-HUB Cables

DESCRIPTION	PART NUMBER	QUANTITY
<p>1. DC POWER CABLES</p> <p>Cables harness to distribute power from Fuse/Alarm Panel to T-HUB units.</p> <p><u>ACX025 Fuse and Alarm Panel Cables:</u></p> <p>Individually Fused Power Feeds:</p> <p>(Two cables are required per FOX-2 T-HUB to fuse each power supply separately).</p> <p>17 inch power cable 23 inch power cable 29 inch power cable 35 inch power cable 41 inch power cable 47 inch power cable 53 inch power cable 59 inch power cable 65 inch power cable 71 inch power cable 77 inch power cable 83 inch power cable 156 inch power cable</p> <p>Dual Fused Power Feeds:</p> <p>(One cable is required per FOX-2 T-HUB since both MAIN and STBY power supplies share a single power feed and fuse).</p> <p>17 inch power cable 23 inch power cable 29 inch power cable 35 inch power cable 41 inch power cable 47 inch power cable 53 inch power cable 59 inch power cable 65 inch power cable 71 inch power cable 77 inch power cable 83 inch power cable 156 inch power cable</p>	<p>AWX127G_</p> <p>AWX127G1 AWX127G2 AWX127G3 AWX127G4 AWX127G5 AWX127G6 AWX127G7 AWX127G8 AWX127G9 AWX127G10 AWX127G11 AWX127G12 AWX127G20</p> <p>AWX192G_</p> <p>AWX192G1 AWX192G2 AWX192G3 AWX192G4 AWX192G5 AWX192G6 AWX192G7 AWX192G8 AWX192G9 AWX192G10 AWX192G11 AWX192G12 AWX192G20</p>	<p>1 or 2 per T-HUB depending power harness utilized.</p> <p>2 per T-HUB</p> <p>1 per T-HUB</p>

TABLE D. FOX-2 T-HUB Cables (Cont.)

DESCRIPTION	PART NUMBER	QUANTITY
1. DC POWER CABLES (Cont.)		
<u>ACX043 Fuse and Alarm Panel:</u>		2 per T-HUB
Individually Fused Power Feeds:	AWX182G_	2 per T-HUB
(Two cables are required per FOX-2 T-HUB to fuse each power supply separately).		
17 inch power cable	AWX182G1	
23 inch power cable	AWX182G2	
29 inch power cable	AWX182G3	
35 inch power cable	AWX182G4	
41 inch power cable	AWX182G5	
47 inch power cable	AWX182G6	
53 inch power cable	AWX182G7	
59 inch power cable	AWX182G8	
65 inch power cable	AWX182G9	
71 inch power cable	AWX182G10	
77 inch power cable	AWX182G11	
83 inch power cable	AWX182G12	
156 inch power cable	AWX182G20	
Dual Fused Power Feeds:	AWX193G_	1 per T-HUB
(One cable is required per FOX-2 T-HUB since both MAIN and STBY power supplies share a single power feed and fuse).		
17 inch power cable	AWX193G1	
23 inch power cable	AWX193G2	
29 inch power cable	AWX193G3	
35 inch power cable	AWX193G4	
41 inch power cable	AWX193G5	
47 inch power cable	AWX193G6	
53 inch power cable	AWX193G7	
59 inch power cable	AWX193G8	
65 inch power cable	AWX193G9	
71 inch power cable	AWX193G10	
77 inch power cable	AWX193G11	
83 inch power cable	AWX193G12	
156 inch power cable	AWX193G20	

TABLE D. FOX-2 T-HUB Cables (Cont.)

DESCRIPTION	PART NUMBER	QUANTITY
2. ALARM RIBBON CABLES		
Ribbon cables to daisy-chain T-HUB alarm and TELTRAC to Fuse/Alarm Panel		
T-HUB to T-HUB cable [Note 1]	AWX104G1	1 per T-HUB
<u>T-HUB to Fuse and Alarm Panel cables:</u>		1 as required
1.5 inch ribbon cable	AWX104G1	
24 inch ribbon cable	AWX104G5	
36 inch ribbon cable	AWX104G6	
72 inch ribbon cable	AWX104G9	
96 inch ribbon cable	AWX104G11	
3. RAC-II CABLES		
T-HUB J7 to ACX043 Fuse/Alarm Panel-J1	AWX181G*	As required if T-HUB is with RAC-II card
T-HUB J7 to female Amphenol connector for interface to HTB013-1 wire-wrap block.	AWX184G*	
Extension cable from AWX184G* to bare wire wire-wrap block interface.	AWX185G*	
4. T1/T1C INTERFACE CABLE (30 pair 22 AWG) [Note 2]	OSC001G*	2 per T-HUB
5. OPTICAL FIBER INTERFACE [Note 3]		2 per LTU
SM, FC-to-FC Patch Cord	OSJ002G*	
SM, FC-to-Biconical Patch Cord	OSJ004G*	
SM, FC/PC-to-bare fiber Pigtail	OSP001G*	

* G number indicates length in feet.

Note 1: A 1.5-inch ribbon cable is included in the basic FOX-2 T-HUB cage assembly for interface to a Fuse and Alarm Panel mounted directly above. For longer cable lengths, consult the table.

Note 2: G number suffix indicates cable length in feet up to 655 feet max.

Note 3: The quantity and use of optical patch cords and/or pigtails is dependent upon the fiber termination equipment utilized, the number of DS-2 optical spans and whether each span is protected for unprotected. G number suffix indicates fiber length in feet.

TABLE D. FOX-2 T-HUB Cables (Cont.)

DESCRIPTION	PART NUMBER	QUANTITY
<p>5. TELTRAC CABLES</p> <p>Cables required to interconnect the Fuse and Alarm Panel with external transmission facilities.</p> <p>Fuse Panel-to-Fuse Panel [Note 1]</p> <p>Fuse Panel-to-828M/828F/M560 system (modular to dual row) [Note 1]</p> <p>Modular connector to female 25-pin sub-D connector (3-foot patch cord)</p> <p>Modular connector to male 25-pin sub-D connector (3-foot patch cord)</p> <p>Male 25-pin sub-D connector to male 25-pin sub-D connector [Note 2]</p> <p>Fuse and Alarm Panel to Service Channel unit (Modular to dual row connector) [Note 1]</p>	<p>AWX105G*</p> <p>AWX125G*</p> <p>AWX126G1</p> <p>AWX126G2</p> <p>AWX071G*</p> <p>AWX138G*</p>	<p>As required if equipped for TELTRAC</p>

Note 1: G number suffix indicates length of cable, ordered in increments of: 6, 12, 18, 24, 30, 36, 48, and 60 feet.

Note 2: G number suffix indicates length of cable, ordered in 5-foot increments up to 75 feet maximum. (Example: AWX071G5- five feet.)

