DDM-Plus
Equipment Engineering and Ordering Guide

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1. Overview

This guide is designed to facilitate the equipment engineer's job in issuing a telephone equipment order (TEO). It is not intended to replace standard engineering documentation, for example, SDs, equipment drawings, etc. Although not required as a part of a DDM-Plus order, if used, this guide will ensure that all elements of the DDM-Plus and related interfaces arrive and are installed on schedule to ensure the timely turnup of DDM-Plus equipment.

The *DDM-Plus Documentation* section in this guide lists several documents that will assist various organizations in developing the information ultimately required for planning, engineering, and ordering DDM-Plus equipment and associated interfaces. These documents include recommendations for operations, provisioning, and maintenance activities that may affect operations personnel planning. Your regional AT&T Account Representative can furnish you with additional planning aids and discuss available management and craft personnel training courses for planning, ordering, and maintaining DDM-Plus equipment.

In addition to standard documentation, customized on-line aid for customer help (COACH) tools are available to support customer staff needs using an "800" number. Anyone desiring this free capability should contact his/her company's DDM-Plus customer support tools coordinator, whose name is available through a regional AT&T Account Representative or Regional Technical Assistance Center (RTAC) consultant.

Although it is not necessary to include this document as a part of the TEO, by selecting, completing, and including those pages applicable to your order, it will more likely ensure that all equipment and interfaces are installed and ready on time. In addition, if this document is retained as a permanent record for the DDM-Plus equipment and interfaces, it may substantially reduce the effort required to issue future DDM-Plus TEOs for that office.

This document is intended as a guide for end-users with responsibilities for engineering and ordering DDM-Plus in central office bay arrangements or stand-alone environments.

This document is reissued to add information for the AEK86B (replaces the AEK86) and the AEK90 repeaters, to add information for the new ED-8C730-33 Wall/Desk Distant Terminal (replacing the ED-8C730-30) and to remove the 30-foot minimum cable length restriction for DS1 cabling to DDM-Plus equipment.

This practice does not contain safety labels.

AT&T welcomes your comments on this practice. Your comments will aid in improving the quality and usefulness of AT&T documentation. Please use the Feedback Form provided at the end of this practice.

Additional copies of this practice and any associated appendixes may be ordered from the AT&T Customer Information Center by using one of the applicable methods:

(a) **AT&T Employees:**
AT&T employees should process their orders as follows:

- Call 1-800-432-6600

  or

- Complete Form IND1-80.80 and mail to:

  AT&T Customer Information Center
  Attention: Order Entry Department
  2855 N. Frankin Road
  P.O. Box 19901
  Indianapolis, IN 46219-1999

(b) **RBOC/BOC:**
These orders should be processed through your Company Documentation Coordinator.

(c) **Federal Government:**
These orders should be processed as follows:

Call (919) 279-7424

or

Mail your order to:

AT&T
P.O. Box 20046
Greensboro, NC 27420

(d) **All Others:**
Call 1-800-432-6600

Every effort was made to ensure that the information in this practice was complete and accurate at the time of printing. However, information is subject to change.

FCC WARNING: *This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.*

This document was developed by the AT&T Customer Information Development and Business Translations Organization.

2. DDM-Plus Documentation

DDM-Plus Equipment and Associated Circuit Drawings

Refer to Table 1 for available equipment and circuit drawings for the DDM-Plus.

Table 1. Equipment and Associated Circuit Drawings

Document No.	Document Title
J98725DB-1	DDM-Plus Extension Shelf
ED-8C730-10	Typical Bay Arrangements
ED-8C730-20	Cable Assemblies
ED-8C730-30*	Wall/Desk DT Shelf Assembly
ED-8C730-33	Wall/Desk DT Shelf Assembly
ED-8C730-32	Plug-In Packages
ED-8C732-20	Cabinet Cable Assemblies
SD-7C514-01	Wall/Desk DT Application Schematic
SD-7C559-01	Application Schematic
T-7C514-31	Wall/Desk DT Installer Wiring
T-7C559-31	Installer Interconnect Wiring
T-82046-30	Power Systems DC Distribution Circuit for Digital Transmission System

* Replaced by ED-8C730-33

Floor Plan Data Sheets

FPD 801-525-169 — DDM-Plus Floor Plan Data Sheets

AT&T Practices

Refer to Table 2 for available DDM-Plus user documents.

Table 2. AT&T Practices

Document No.	Document Title
AT&T 363-206-150	*DDM-Plus User/Service Manual*
AT&T 363-206-151	*DDM-Plus Installation Manual* (for Customers Employing Self-Installation)
AT&T 363-206-152	*DDM-Plus Quick Reference Guide*
AT&T 363-206-153	*DDM-Plus Software Release Description*
AT&T 363-206-156	*DDM-Plus Equipment Engineering and Ordering Guide*
AT&T 363-206-157	*DDM-Plus ED-8C730-33 Wall Distant Terminal Installation Manual*
AT&T 365-200-004	*T1 Carrier System AEK 88 Repeater*
AT&T 365-200-005	*T1 Carrier System AEK 90 Repeater*
AT&T 365-200-006	*T1 Carrier System AEK 86B Repeater*

Customer Support Tools

Several free on-line support tools are available using "800" numbers to assist customers in their planning, engineering, ordering, and maintenance activities. Please consult with your company's customer support tools coordinator, whose name is available through your regional AT&T Account Manager or RTAC Consultant.

The DDM-Plus training is available for management and craft personnel at Lisle, Illinois. Upon special request, it may be suitcased to company locations. Please consult with your AT&T Account Manager for additional information or reservations.

Engineering and Installation Services

AT&T Network Systems Engineering and Installation Support Services are provided by a highly skilled force of engineering and installation specialists. Support personnel employ state of the art technology, equipment, and procedures in providing customers highly competent, rapid response services. You are assured that all material engineered and installed by AT&T has been thoroughly tested and integrated into a reliable operating system at cutover.

Engineering and installation services fall into two broad categories, which are termed "traditional" and "nontraditional." The traditional classification is comprised of the following functions that have been performed traditionally to analyze your request:

- Prepare detailed specifications for manufacturing and installation
- Create and maintain job records
- Install, test, and turn over a working system.

The nontraditional classification consists of specialized engineering and installation services that respond to customer requests for unusual or highly individualized applications. Following is a brief description of some of these specialized services:

- **Engineering Consultation** — This service covers such subjects as central office modernization, diagnostic assistance, cost effective equipment planning, proper space utilization and layout, plus specific studies and recommendations relating to any aspect of the customer's network.
- **Data Base Preparation** — This service provides for the accurate, efficient, economical conversion of customer data from one format or medium to another. It might also include the creation of data bases from information not previously preserved in an organized way.
- **Energy Modernization and Network Protection** — Through on-site surveys these services will find any hidden energy problems, minimize fire and hazardous material risks, and recommend the corrective and/or protective actions.

There are many benefits associated with AT&T Contracting Engineering and Installation Services: through the application of AT&T's complete network of services and customer support you are assured that your system's order is integrated into a complete working system tailored to your office conditions and preferences. This process seamlessly provides for your complete needs, as in the provision of cable, lighting and power equipment, and including ancillary connections to your local and/or remoted alarm systems. In addition, because your office needs are analyzed as a package, we assure you that all requirements for modifying existing equipment and software are met as required by your specific operating standards.

Seamless installation services ensure cutover of quality tested, operational fault free systems. Our installation forces will assemble your job, complete the cabling and power supply requirements, wire the components, and respond to any customer changes during the course of installation. All systems are thoroughly inspected and tested to verify compliance to operational standards. Once approved by AT&T's quality assurance test group (the industry's toughest), your system is turned over to you.

Support services also provides the following:

- **Records Management (Creation/Maintenance)** — AT&T will create, update, maintain, and distribute complete office records to your standards. Creating and maintaining comprehensive office records allow you to identify equipment efficiently for future changes, warranty work, and subsequent office additions.
- **Full Service Warranty with Guaranteed Quality** — AT&T's record capabilities can identify and provide automatic application of operationally effective change notices (CNs). Also, as part of AT&T's Design Change Management System (DCMS), you are provided with an office-by-office CN application status.

In addition, DCMS identifies optional CNs, which you can apply to increase system equipment effectiveness.

To obtain more information on AT&T's Engineering and Installation Support Services, consult your local AT&T Account Executive.

DDM-Plus Loop Enclosure Documentation

This document is intended as a guide for engineering and ordering DDM-Plus in central office bay arrangements or stand-alone environments. DDM-Plus equipment is available in all the traditional loop enclosure arrangements, such as those described in AT&T 363-206-150, *DDM-Plus User/Service Manual.* Ordering information and reference to loop documentation supporting these arrangements are provided by the following documents:

AT&T 363-205-000 — **SLC®** *Series 5 Carrier System Ordering Guide — Loop Transmission Systems*

AT&T 363-205-010 — **SLC®** *Series 5 Carrier System Applications and Planning Guide*

AT&T 626-500-105 — *80-Type Cabinets Ordering Information and Lettering Guide*

AT&T 626-500-115 — *90-Type Cabinet Coding Scheme and Ordering Information*

Instructions for Completing the Order Blank

Complete the equipment order form.

The information in the *DDM-Plus Ordering Guide* section is used for ordering DDM-Plus Extension Shelf equipment. Wall DT equipment is ordered using the *DDM-Plus Wall Distant Terminal Ordering.* The information in the *Miscellaneous Equipment and Tools* section covers miscellaneous equipment/tools.

The ordering guide is structured in the form of a questionnaire, which requires the entering of quantities or other data to assist in the engineering of the job. Only those pages pertaining to this particular order should be attached to the order sheet. Each page attached should have the header information completed.

INSERT TELEPHONE EQUIPMENT ORDER FORM HERE

INSERT TELEPHONE EQUIPMENT ORDER FORM HERE

3. DDM-Plus Extension Shelf Ordering

This section covers ordering information for the DDM-Plus Extension Shelf assembly and intershelf cabling. The *CLEI** code for the Extension Shelf is T1MRU00XRB. When ordered with a heat baffle, it is T1RU00XRC. Before getting into the ordering sections, a brief description of the physical arrangements for the DDM-Plus Extension Shelf is presented below.

The DDM-Plus J98725DB-1 shelf is capable of extending up to 28 DS1 signals either optically, in groups of four DS1s (with or without protection), or electrically over standard copper T1 facilities, one DS1 per two (T&R) copper pairs (no protection). The shelf can accommodate mixes of both optical and electrical interfaces with some simple restrictions. A shelf arranged for full optical capability requires up to 28 lightguide cables (protected) or 14 lightguide cables (unprotected). A shelf fully arranged for electrical interfaces requires up to 28 T&R copper pairs. A shelf can be cabled for both optical and electrical interfaces when the actual interface is unknown at the time of ordering; however, the plug-in equipage must follow specific guidelines. Refer to the *Individual Plug-In Ordering* section. When cabled for both, it is recommended that optical line interface units (OLIUs) grow from left-to-right, and AEKs grow from right-to-left.

Although each shelf is ordered separately and may be mounted as a stand-alone or miscellaneous mount item, suggested "typical" bay arrangements are provided per ED-8C730-10 that gives complete engineering information and fits traditional central office design criteria. Figure 1 shows the typical bay arrangement per ED-8C730-10.

The DDM-Plus shelf is completely connectorized; thus, when bay cabling is installed on an initial order, shelf additions are made simple for local technicians without the need for installation forces, thereby deferring costs to a point just prior to service needs. Since shelves, standardized cable assemblies, and plug-ins are stocked at AT&T Material Distribution Centers (MDCs), order turnaround is substantially reduced for most common arrangements.

* COMMON LANGUAGE is a registered trademark and CLEI, CLLI, CLCI, and CLFI are trademarks of Bell Communications Research, Inc.

DDM-Plus Shelf Assembly, J98725DB-1, List 1, Ordering

This section will provide ordering information for a single DDM-Plus shelf. If you plan to structure DDM-Plus shelves in bay arrangements, additional information will be required for shelf placement, which will be covered in the section *DDM-Plus J98725DB-1 Shelf Orders for Central Office Bay Arrangements.*

DDM-Plus J98725DB-1 Single Shelf Order Form and ED-8C730-32 Ordering Packages

The order forms shown in Tables 3 and 4 provide an ordering package for the DDM-Plus shelf and all cabling interfaces. In addition, a shelf can be ordered with certain quantities of plug-ins.*

Individual plug-in orders are covered in the *Individual Plug-In Ordering* section.

* Note that shelves may be ordered by specifying the specific equipment code (J98725DB-1 List 1 or List 2), or from the plug-in ordering drawing (ED-8C730-32, G1 or G2).

Provide one blank per shelf ordered

Table 3. Single Shelf Equipment Order Blank

Qty Ord	Equipment Code	Equipment Furnished with Group Ordered: Shelf	Heat Baffle	25A OLIU	25F OLIU	AEK86B Repeater	AEK88 Repeater	AEK90 Repeater	See Note	Description
	J98725DB-1,List 1	1							1,2,3	Unequipped shelf
	J98725DB-1,List 2		1						1,4	Single heat baffle
	ED-8C730-32,G1	1							1,2,3	Unequipped shelf
	ED-8C730-32,G2		1						1,4	Single heat baffle
	ED-8C730-32,G3			1					5,9,10	Order 1 to 7 units for 1 to 7 unprotected optical lines.
	ED-8C730-32,G4				1				6,9,10	Order 2 to 14 units for 1 to 7 protected optical lines.
	ED-8C730-32,G5					1			7,10	Order 1 to 28 units for 1 to 28 electrical T1 T&R pairs.
	ED-8C730-32,G6						1		8,10	
	ED-8C730-32,G10							1	10,11	

See notes on the following page.

Table 3. Single Shelf Equipment Order Blank (Contd)

Notes:

1. Shelves may be ordered by specifying the specific equipment code (J98725DB-1 List 1 or List 2), or from the plug-in ordering drawing (ED-8C730-32, G1 or G2).
2. See Figure 2 for examples of shelf plug-in arrangements.
3. Included with each shelf are hardware required for bay mounting, a box of five spare fuses, cable clamps for dressing, and AT&T 363-206-150, *DDM-Plus User/Service Manual.*
4. A heat baffle assembly should be ordered with each shelf assembly, as shown in Figure 1, except for the top shelf in a 7-ft. bay arrangement. When the 7-ft. layout is mounted in 9- or 11-ft. 6-in. bays, a baffle should also be ordered for the top shelf (see ED-8C730-10 for complete bay assembly information).
5. The 25A optical line interface unit (OLIU) is equipped with a 780-nm laser with an approximate span range of 3.1 km for single mode and 2.2 km for multimode fiber. Each end of the optical facility must have the same coded OLIU.
6. The 25F OLIU is equipped with a 1300-nm laser with an approximate span range of 23 km for single mode and 14.5 km for multimode fiber. Each end of the optical facility must have the same coded OLIU.
7. The AEK86B repeater is designed to accommodate a maximum loop resistance of 2100 ohms, which will normally accommodate approximately eight repeater sections and 50 kft of 22 AWG PIC cable, and up to 85 ft to the DSX.
8. The AEK88 repeater is designed to accommodate a maximum loop resistance of 300 ohms, which will normally accommodate approximately one repeater section and 9 kft of 22 AWG PIC cable, and up to 85 cable feet to the DSX. It may also be used as an office looping repeater.
9. If protection is not equipped for the 25-type OLIUs, it is then recommended that two AEK39 BP1 plug-ins be inserted in the unequipped slot to prevent inadvertent insertion of AEK-type repeaters. The AEK39 BP1 is the same plug-in used in unused DS1 positions in the DDM-1000 shelf.
10. To order spare plug-ins refer to the *Individual Plug-In Ordering* section.
11. The AEK90 repeater is designed to accommodate a maximum loop resistance 2100 ohms which will normally accommodate approximately eight repeater sections and 50 kft of 22 AWG PIC cable and up to 655 feet to the DSX-1.

(Provide one blank per shelf ordered) TEO No.| Section | Page | Date
Refer to Table 5.

Table 4. Cabling Associated with Single Shelf Order Blank

Qty Ord	Cable Description (ED-8C730-20)	Enter Group Number (See Note 1)	Enter Length (Feet) if Req	Select No More Than	See Note
	Power Cord			1	2
	Office Alarm Interface			1	
	Parallel Telemetry Interface			1	3
	Fault Locate Interface			1	
	DDM-Plus to DSX-1			1	
	DDM-Plus to T1 Line			1	4

Notes:

1. Select ED-8C730-20 Group number from Table 5.
2. The single shelf power cord is designed to be spliced to a central office feeder. Consult FPD 801-525-169 and T-82046-30 for power feeder requirements.
3. To accommodate locations where parallel telemetry interfaces are required to remote maintenance centers, each DDM-Plus shelf provides a parallel telemetry port with alarm, system ID, and location information. The parallel telemetry interface cabling should be provided for these applications.
4. When the electrical interface is required (AEK-type repeaters), one cable group is ordered that wires to all T1 interfaces, regardless of the number of T1 lines that will actually interface with the shelf. If some interfaces are to be lightwave (mixed shelf), the unused corresponding electrical cabling provided may be open-ended or terminated in the main distributing frame (MDF) for possible future copper conversions.

Table 5. ED-8C730-20 Group Structure

Cable Description	Number of Inputs	Number of DS1s	Group Number	Length (Feet)	Cable Type	See Note
Power Cord, Single Shelf (1 per shelf, -48 V A&B)	1		21	12	10GA	1
Office Alarm Interface for Single Shelf or Shelf 1 in Bay Arrangement	1		10	150	816AS	1
			2	As req'd		2
Parallel Telemetry Interface for Single Shelf	1		23	150	800AS	1
			22	As req'd		2
Fault Locate Interface	1		12	150	812AS	1
			4	As req'd		2
DDM-Plus to DSX-1		28	17	85	613C	1
			18	150		1
			7	As req'd, max 655		2,4
			19	85	1249C	1,2,3
			20	150		1,2,3
			8	As req'd, max 450		2,3,4
DDM-Plus to T1 Line		28	13	100	613C	1
			14	200		1
			5	As req'd, max 200		2
			15	100	1249C	1,3
			16	200		1,3
			6	As req'd, max 200		2,3

Notes:

1. Cable stocked at AT&T MDCs for reduced order interval (1-2 weeks).
2. Order must specify cable length. Order interval approximately 4 weeks.
3. This cable is the recommended cable for these connections.
4. The maximum distance shown for DSX-1 cables is for connection to the 25-type OLIUs or AEK90 repeaters, which provide cable equalization options for specific distances to the DSX-1 frame. The maximum distance for AEK-type repeaters, which do not have cable equalization options (AEK86B, AEK88), is 85 feet to the DSX-1 frame.

DDM-Plus J98725DB-1 Shelf Orders for Central Office Bay Arrangements

Although DDM-Plus shelves are normally ordered as stand-alone entities, typical bay arrangements can be locally engineered and installed per Figure 1.

Typical Bay Arrangement for DDM-Plus

Figure 1 provides a typical bay arrangement (ED-8C730-10) for up to six DDM-Plus shelves. This arrangement meets network equipment building system (NEBS) central office requirements for bay heat dissipation. Although additional space is available in the bay, it should not be used for miscellaneous equipment if the NEBS requirements are to be met. In addition, if other than the typical arrangements are used, normal heat flow could be interrupted and adversely affect shelf operation. Heat baffles must be placed as indicated to guarantee proper air circulation. Although the typical bay figure reflects 7-foot bay arrangements, 9-foot or 11-foot 6-inch bays may be used providing the shelf arrangements are identical to those shown for the 7-foot arrangements.

The Shelf Order Blank for bay arrangements in Tables 6, 7, 9, 11, 13, 15, and 17 provides ordering information for up to six DDM-Plus shelves. Shelves may be ordered with or without basic plug-in packages, as indicated. Space is provided at the top of the form to enter the Relay Rack Number for the central office in which it is to be installed.

As shown, there are eight shelf options from which several combinations may be selected (J98725DB-1 List 1,2; ED-8C730-32,G1-G6) for each shelf in the bay. As mentioned earlier, shelves can be added incrementally by local technicians (since all cabling is connectorized) if interbay cabling is initially provided for the bay layout. It should be noted that a shelf position number is provided in the first column to the left. The "Quantity Ordered" column should be filled out only for those shelves that are to be initially provided in the bay.

For each shelf ordered above, a Shelf Interbay Cabling Order (following the Shelf Order Blank) should be filled out to accommodate the specific network and OS needs for that central office, using the guidelines established in the referenced tables, notes, and figures. Shelf Interbay Cabling may also be ordered for shelves that are to be added at a later date.

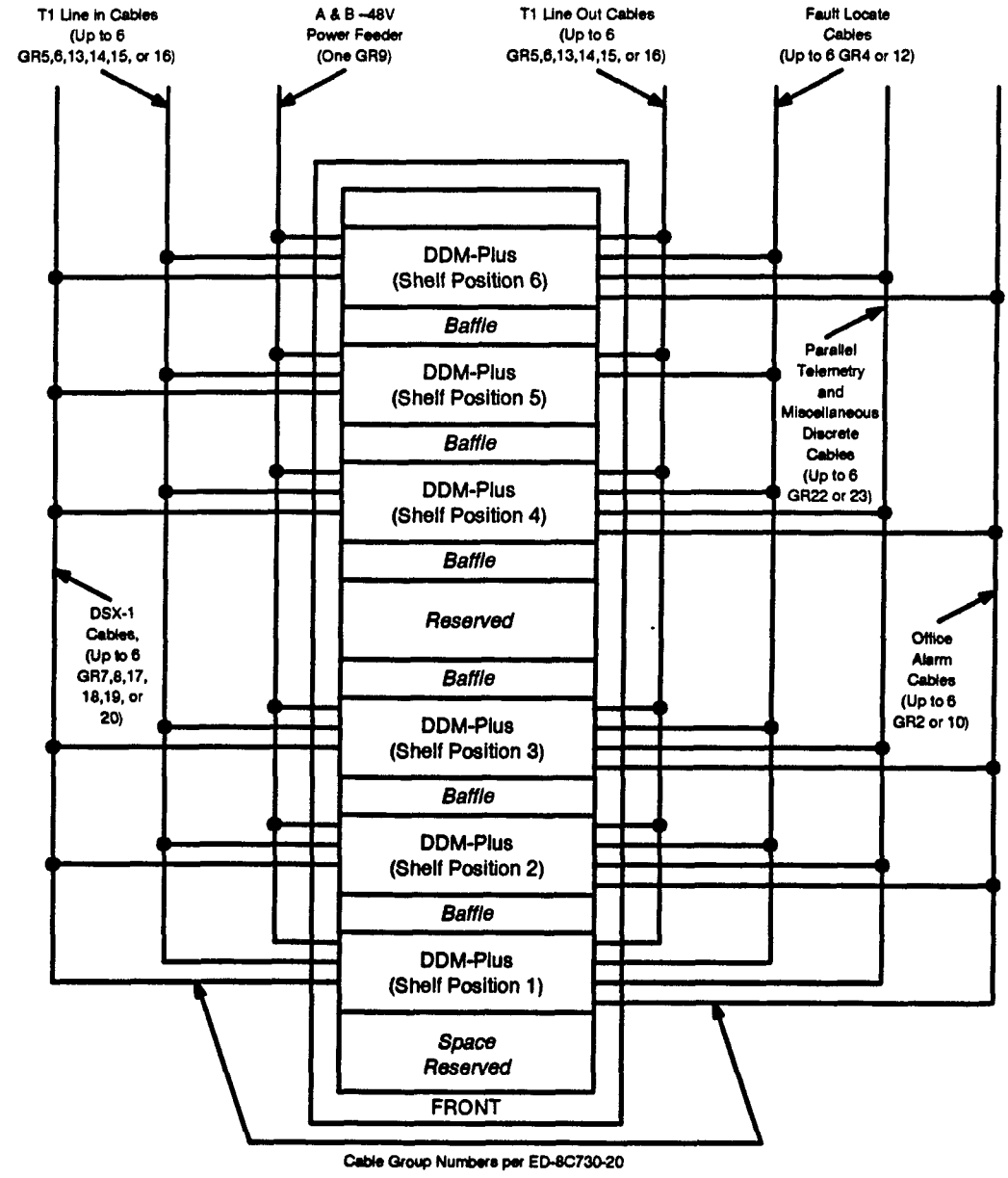

Figure 1. Typical Bay Arrangement for DDM-Plus Configuration Per ED-8C730-10

Typical Bay Arrangement Selected per ED-8C730-10: TEO No.| Section | Page | Date
Relay Rack Number:_____

Table 6. Shelf Order Blank for Bay Arrangements (Shelf 1)

Shelf Pos. # (Fig. 1)	Qty Ord	Equipment Code	Equipment Furnished with Group Ordered							See Note	Description
			Shelf	Heat Baffle	25A OLIU	25F OLIU	AEK86B Repeater	AEK88 Repeater	AEK90 Repeater		
		J98725DB-1,List 1	1							1,2,3	Unequipped shelf
		J98725DB-1,List 2		1						1,4	Single heat baffle
		ED-8C730-32,G1	1							1,2,3	Unequipped shelf
1		ED-8C730-32,G2		1						1,4	Single heat baffle
		ED-8C730-32,G3			1					5,9,10	Order 1 to 7 units for 1 to 7 unprotected optical lines.
		ED-8C730-32,G4				1				6,9,10	Order 2 to 14 units for 1 to 7 protected optical lines.
		ED-8C730-32,G5					1			7,10	Order 1 to 28 units for 1 to 28 electrical T1 T&R pairs.
		ED-8C730-32,G6						1		8,10	
		ED-8C730-32,G10							1	10,11	

See notes on the following page.

Table 6. Shelf Order Blank for Bay Arrangements (Shelf 1) (Contd)

Notes:

1. Shelves may be ordered by specifying the specific equipment code (J98725DB-1 List 1 or List 2), or from the plug-in ordering drawing (ED-8C730-32, G1 or G2).
2. See Figure 2 for examples of shelf plug-in arrangements.
3. Included with each shelf are hardware required for bay mounting, a box of five spare fuses, cable clamps for dressing, and AT&T 363-206-150, *DDM-Plus User/Service Manual.*
4. A heat baffle assembly should be ordered with each shelf assembly, as shown in Figure 1, except for the top shelf in a 7-ft. bay arrangement. When the 7-ft. layout is mounted in 9- or 11-ft. 6-in. bays, a baffle should also be ordered for the top shelf (see ED-8C730-10 for complete bay assembly information).
5. The 25A OLIU is equipped with a 780-nm laser with an approximate span range of 3.1 km for single mode and 2.2 km for multimode fiber. Each end of the optical facility must have the same coded OLIU.
6. The 25F OLIU is equipped with a 1300-nm laser with an approximate span range of 23 km for single mode and 14.5 km for multimode fiber. Each end of the optical facility must have the same coded OLIU.
7. The AEK86B repeater is designed to accommodate a maximum loop resistance of 2100 ohms, which will normally accommodate approximately nine repeater sections and 50 kft of 22 AWG PIC cable, and up to 85 ft to the DSX.
8. The AEK88 repeater is designed to accommodate a maximum loop resistance of 300 ohms, which will normally accommodate approximately one repeater section and 9 kft of 22 AWG PIC cable, and up to 85 cable feet to the DSX. It may also be used as an office looping repeater.
9. If protection is not equipped for the 25-type OLIUs, it is then recommended that two AEK39 BP1 plug-ins be inserted in the unequipped slot to prevent inadvertent insertion of AEK-type repeaters. The AEK39 BP1 is the same plug-in used in unused DS1 positions in the DDM-1000 shelf.
10. To order spare plug-ins refer to the *Individual Plug-In Ordering* section.
11. The AEK90 repeater is designed to accommodate a maximum loop resistance 2100 ohms which will normally accommodate approximately eight repeater sections and 50 kft of 22 AWG PIC cable and up to 655 feet to the DSX-1.

(Continued on next page)

Typical Bay Arrangement Selected per ED-8C730-10: TEO No.| Section | Page | Date
Relay Rack Number:_____

Table 6. Shelf Order Blank for Bay Arrangements (Shelf 2) (Contd)

Shelf Pos. # (Fig. 1)	Qty Ord	Equipment Code	Equipment Furnished with Group Ordered							See Note	Description
			Shelf	Heat Baffle	25A OLIU	25F OLIU	AEK86B Repeater	AEK88 Repeater	AEK90 Repeater		
		J98725DB-1,List 1	1							1,2,3	Unequipped shelf
		J98725DB-1,List 2		1						1,4	Single heat baffle
		ED-8C730-32,G1	1							1,2,3	Unequipped shelf
2		ED-8C730-32,G2		1						1,4	Single heat baffle
		ED-8C730-32,G3			1					5,9,10	Order 1 to 7 units for 1 to 7 unprotected optical lines.
		ED-8C730-32,G4				1				6,9,10	Order 2 to 14 units for 1 to 7 protected optical lines.
		ED-8C730-32,G5					1			7,10	Order 1 to 28 units
		ED-8C730-32,G6						1		8,10	for 1 to 28
		ED-8C730-32,G10							1	10,11	electrical T1 T&R pairs.

See notes on the following page.

Table 6. Shelf Order Blank for Bay Arrangements (Shelf 2) (Contd)

Notes:

1. Shelves may be ordered by specifying the specific equipment code (J98725DB-1 List 1 or List 2), or from the plug-in ordering drawing (ED-8C730-32, G1 or G2).
2. See Figure 2 for examples of shelf plug-in arrangements.
3. Included with each shelf are hardware required for bay mounting, a box of five spare fuses, cable clamps for dressing, and AT&T 363-206-150, *DDM-Plus User/Service Manual.*
4. A heat baffle assembly should be ordered with each shelf assembly, as shown in Figure 1, except for the top shelf in a 7-ft. bay arrangement. When the 7-ft. layout is mounted in 9- or 11-ft. 6-in. bays, a baffle should also be ordered for the top shelf (see ED-8C730-10 for complete bay assembly information).
5. The 25A OLIU is equipped with a 780-nm laser with an approximate span range of 3.1 km for single mode and 2.2 km for multimode fiber. Each end of the optical facility must have the same coded OLIU at both ends.
6. The 25F OLIU is equipped with a 1300-nm laser with an approximate span range of 23 km for single mode and 14.5 km for multimode fiber. Each end of the optical facility must have the same coded OLIU at both ends.
7. The AEK86B repeater is designed to accommodate a maximum loop resistance of 2100 ohms, which will normally accommodate approximately eight repeater sections and 50 kft of 22 AWG PIC cable, and up to 85 ft to the DSX.
8. The AEK88 repeater is designed to accommodate a maximum loop resistance of 300 ohms, which will normally accommodate approximately one repeater section and 9 kft of 22 AWG PIC cable, and up to 85 cable feet to the DSX. It may also be used as an office looping repeater.
9. If protection is not equipped for the 25-type OLIUs, it is then recommended that two AEK39 BP1 plug-ins be inserted in the unequipped slot to prevent inadvertent insertion of AEK-type repeaters. The AEK39 BP1 is the same plug-in used in unused DS1 positions in the DDM-1000 shelf.
10. To order spare plug-ins refer to the *Individual Plug-In Ordering* section.
11. The AEK90 repeater is designed to accommodate a maximum loop resistance 2100 ohms which will normally accommodate approximately eight repeater sections and 50 kft of 22 AWG PIC cable and up to 655 feet to the DSX-1.

(Continued on next page)

Typical Bay Arrangement Selected per ED-8C730-10: TEO No. | Section | Page | Date
Relay Rack Number:_____

Table 6. Shelf Order Blank for Bay Arrangements (Shelf 3) (Contd)

Shelf Pos. # (Fig. 1)	Qty Ord	Equipment Code	Equipment Furnished with Group Ordered							See Note	Description
			Shelf	Heat Baffle	25A OLIU	25F OLIU	AEK86B Repeater	AEK88 Repeater	AEK90 Repeater		
		J98725DB-1,List 1	1							1,2,3	Unequipped shelf
		J98725DB-1,List 2		1						1,4	Single heat baffle
		ED-8C730-32,G1	1							1,2,3	Unequipped shelf
3		ED-8C730-32,G2		1						1,4	Single heat baffle
		ED-8C730-32,G3			1					5,9,10	Order 1 to 7 units for 1 to 7 unprotected optical lines.
		ED-8C730-32,G4				1				6,9,10	Order 2 to 14 units for 1 to 7 protected optical lines.
		ED-8C730-32,G5					1			7,10	Order 1 to 28 units for 1 to 28 electrical T1 T&R pairs.
		ED-8C730-32,G6						1		8,10	
		ED-8C730-32,G10							1	10,11	

See notes on the following page.

Table 6. Shelf Order Blank for Bay Arrangements (Shelf 3) (Contd)

Notes:

1. Shelves may be ordered by specifying the specific equipment code (J98725DB-1 List 1 or List 2), or from the plug-in ordering drawing (ED-8C730-32, G1 or G2).
2. See Figure 2 for examples of shelf plug-in arrangements.
3. Included with each shelf are hardware required for bay mounting, a box of five spare fuses, cable clamps for dressing, and AT&T 363-206-150, *DDM-Plus User/Service Manual.*
4. A heat baffle assembly should be ordered with each shelf assembly, as shown in Figure 1, except for the top shelf in a 7-ft. bay arrangement. When the 7-ft. layout is mounted in 9- or 11-ft. 6-in. bays, a baffle should also be ordered for the top shelf (see ED-8C730-10 for complete bay assembly information).
5. The 25A OLIU is equipped with a 780-nm laser with an approximate span range of 3.1 km for single mode and 2.2 km for multimode fiber. Each end of the optical facility must have the same coded OLIU at both ends.
6. The 25F OLIU is equipped with a 1300-nm laser with an approximate span range of 23 km for single mode and 14.5 km for multimode fiber. Each end of the optical facility must have the same coded OLIU at both ends.
7. The AEK86B repeater is designed to accommodate a maximum loop resistance of 2100 ohms, which will normally accommodate approximately eight repeater sections and 50 kft of 22 AWG PIC cable, and up to 85 ft to the DSX.
8. The AEK88 repeater is designed to accommodate a maximum loop resistance of 300 ohms, which will normally accommodate approximately one repeater section and 9 kft of 22 AWG PIC cable, and up to 85 cable feet to the DSX. It may also be used as an office looping repeater.
9. If protection is not equipped for the 25-type OLIUs, it is then recommended that two AEK39 BP1 plug-ins be inserted in the unequipped slot to prevent inadvertent insertion of AEK-type repeaters. The AEK39 BP1 is the same plug-in used in unused DS1 positions in the DDM-1000 shelf.
10. To order spare plug-ins refer to the *Individual Plug-In Ordering* section.
11. The AEK90 repeater is designed to accommodate a maximum loop resistance 2100 ohms which will normally accommodate approximately eight repeater sections and 50 kft of 22 AWG PIC cable and up to 655 feet to the DSX-1.

(Continued on next page)

Typical Bay Arrangement Selected per ED-8C730-10: TEO No.| Section | Page | Date
Relay Rack Number:_____

Table 6. Shelf Order Blank for Bay Arrangements (Shelf 4) (Contd)

Shelf Pos. # (Fig. 1)	Qty Ord	Equipment Code	Equipment Furnished with Group Ordered							See Note	Description
			Shelf	Heat Baffle	25A OLIU	25F OLIU	AEK86B Repeater	AEK88 Repeater	AEK90 Repeater		
4		J98725DB-1,List 1	1							1,2,3	Unequipped shelf
		J98725DB-1,List 2		1						1,4	Single heat baffle
		ED-8C730-32,G1	1							1,2,3	Unequipped shelf
		ED-8C730-32,G2		1						1,4	Single heat baffle
		ED-8C730-32,G3			1					5,9,10	Order 1 to 7 units for 1 to 7 unprotected optical lines.
		ED-8C730-32,G4				1				6,9,10	Order 2 to 14 units for 1 to 7 protected optical lines.
		ED-8C730-32,G5					1			7,10	Order 1 to 28 units
		ED-8C730-32,G6						1		8,10	for 1 to 28
		ED-8C730-32,G10							1	10,11	electrical T1 T&R pairs.

See notes on the following page.

Table 6. Shelf Order Blank for Bay Arrangements (Shelf 4) (Contd)

Notes:

1. Shelves may be ordered by specifying the specific equipment code (J98725DB-1 List 1 or List 2), or from the plug-in ordering drawing (ED-8C730-32, G1 or G2).
2. See Figure 2 for examples of shelf plug-in arrangements.
3. Included with each shelf are hardware required for bay mounting, a box of five spare fuses, cable clamps for dressing, and AT&T 363-206-150, *DDM-Plus User/Service Manual.*
4. A heat baffle assembly should be ordered with each shelf assembly, as shown in Figure 1, except for the top shelf in a 7-ft. bay arrangement. When the 7-ft. layout is mounted in 9- or 11-ft. 6-in. bays, a baffle should also be ordered for the top shelf (see ED-8C730-10 for complete bay assembly information).
5. The 25A OLIU is equipped with a 780-nm laser with an approximate span range of 3.1 km for single mode and 2.2 km for multimode fiber. Each end of the optical facility must have the same coded OLIU at both ends.
6. The 25F OLIU is equipped with a 1300-nm laser with an approximate span range of 23 km for single mode and 14.5 km for multimode fiber. Each end of the optical facility must have the same coded OLIU at both ends.
7. The AEK86B repeater is designed to accommodate a maximum loop resistance of 2100 ohms, which will normally accommodate approximately eight repeater sections and 50 kft of 22 AWG PIC cable, and up to 85 ft to the DSX.
8. The AEK88 repeater is designed to accommodate a maximum loop resistance of 300 ohms, which will normally accommodate approximately one repeater section and 9 kft of 22 AWG PIC cable, and up to 85 cable feet to the DSX. It may also be used as an office looping repeater.
9. If protection is not equipped for the 25-type OLIUs, it is then recommended that two AEK39 BP1 plug-ins be inserted in the unequipped slot to prevent inadvertent insertion of AEK-type repeaters. The AEK39 BP1 is the same plug-in used in unused DS1 positions in the DDM-1000 shelf.
10. To order spare plug-ins refer to the *Individual Plug-In Ordering* section.
11. The AEK90 repeater is designed to accommodate a maximum loop resistance 2100 ohms which will normally accommodate approximately eight repeater sections and 50 kft of 22 AWG PIC cable and up to 655 feet to the DSX-1.

(Continued on next page)

Typical Bay Arrangement Selected per ED-8C730-10: TEO No.| Section | Page | Date
Relay Rack Number:_____

Table 6. Shelf Order Blank for Bay Arrangements (Shelf 5) (Contd)

Shelf Pos. # (Fig. 1)	Qty Ord	Equipment Code	Equipment Furnished with Group Ordered							See Note	Description
			Shelf	Heat Baffle	25A OLIU	25F OLIU	AEK86B Repeater	AEK88 Repeater	AEK90 Repeater		
		J98725DB-1,List 1	1							1,2,3	Unequipped shelf
		J98725DB-1,List 2		1						1,4	Single heat baffle
		ED-8C730-32,G1	1							1,2,3	Unequipped shelf
5		ED-8C730-32,G2		1						1,4	Single heat baffle
		ED-8C730-32,G3			1					5,9,10	Order 1 to 7 units for 1 to 7 unprotected optical lines.
		ED-8C730-32,G4				1				6,9,10	Order 2 to 14 units for 1 to 7 protected optical lines.
		ED-8C730-32,G5					1			7,10	Order 1 to 28 units
		ED-8C730-32,G6						1		8,10	for 1 to 28
		ED-8C730-32,G10							1	10,11	electrical T1 T&R pairs.

See notes on the following page.

Table 6. Shelf Order Blank for Bay Arrangements (Shelf 5) (Contd)

Notes:

1. Shelves may be ordered by specifying the specific equipment code (J98725DB-1 List 1 or List 2), or from the plug-in ordering drawing (ED-8C730-32, G1 or G2).
2. See Figure 2 for examples of shelf plug-in arrangements.
3. Included with each shelf are hardware required for bay mounting, a box of five spare fuses, cable clamps for dressing, and AT&T 363-206-150, *DDM-Plus User/Service Manual*.
4. A heat baffle assembly should be ordered with each shelf assembly, as shown in Figure 1, except for the top shelf in a 7-ft. bay arrangement. When the 7-ft. layout is mounted in 9- or 11-ft. 6-in. bays, a baffle should also be ordered for the top shelf (see ED-8C730-10 for complete bay assembly information).
5. The 25A OLIU is equipped with a 780-nm laser with an approximate span range of 3.1 km for single mode and 2.2 km for multimode fiber. Each end of the optical facility must have the same coded OLIU at both ends.
6. The 25F OLIU is equipped with a 1300-nm laser with an approximate span range of 23 km for single mode and 14.5 km for multimode fiber. Each end of the optical facility must have the same coded OLIU at both ends.
7. The AEK86B repeater is designed to accommodate a maximum loop resistance of 2100 ohms, which will normally accommodate approximately eight repeater sections and 50 kft of 22 AWG PIC cable, and up to 85 ft to the DSX.
8. The AEK88 repeater is designed to accommodate a maximum loop resistance of 300 ohms, which will normally accommodate approximately one repeater section and 9 kft of 22 AWG PIC cable, and up to 85 cable feet to the DSX. It may also be used as an office looping repeater.
9. If protection is not equipped for the 25-type OLIUs, it is then recommended that two AEK39 BP1 plug-ins be inserted in the unequipped slot to prevent inadvertent insertion of AEK-type repeaters. The AEK39 BP1 is the same plug-in used in unused DS1 positions in the DDM-1000 shelf.
10. To order spare plug-ins refer to the *Individual Plug-In Ordering* section.
11. The AEK90 repeater is designed to accommodate a maximum loop resistance 2100 ohms which will normally accommodate approximately eight repeater sections and 50 kft of 22 AWG PIC cable and up to 655 feet to the DSX-1.

(Continued on next page)

Typical Bay Arrangement Selected per ED-8C730-10: TEO No.| Section | Page | Date
Relay Rack Number:_____

Table 6. Shelf Order Blank for Bay Arrangements (Shelf 6) (Contd)

Shelf Pos. # (Fig. 1)	Qty Ord	Equipment Code	Equipment Furnished with Group Ordered							See Note	Description
			Shelf	Heat Baffle	25A OLIU	25F OLIU	AEK86B Repeater	AEK88 Repeater	AEK90 Repeater		
6		J98725DB-1,List 1	1							1,2,3	Unequipped shelf
		J98725DB-1,List 2		1						1,4	Single heat baffle
		ED-8C730-32,G1	1							1,2,3	Unequipped shelf
		ED-8C730-32,G2		1						1,4	Single heat baffle
		ED-8C730-32,G3			1					5,9,10	Order 1 to 7 units for 1 to 7 unprotected optical lines.
		ED-8C730-32,G4				1				6,9,10	Order 2 to 14 units for 1 to 7 protected optical lines.
		ED-8C730-32,G5					1			7,10	Order 1 to 28 units
		ED-8C730-32,G6						1		8,10	for 1 to 28
		ED-8C730-32,G10							1	10,11	electrical T1 T&R pairs.

See notes on the following page.

Table 6. Shelf Order Blank for Bay Arrangements (Shelf 6) (Contd)

Notes:

1. Shelves may be ordered by specifying the specific equipment code (J98725DB-1 List 1 or List 2), or from the plug-in ordering drawing (ED-8C730-32, G1 or G2).
2. See Figure 2 for examples of shelf plug-in arrangements.
3. Included with each shelf are hardware required for bay mounting, a box of five spare fuses, cable clamps for dressing, and AT&T 363-206-150, *DDM-Plus User/Service Manual.*
4. A heat baffle assembly should be ordered with each shelf assembly, as shown in Figure 1, except for the top shelf in a 7-ft. bay arrangement. When the 7-ft. layout is mounted in 9- or 11-ft. 6-in. bays, a baffle should also be ordered for the top shelf (see ED-8C730-10 for complete bay assembly information).
5. The 25A OLIU is equipped with a 780-nm laser with an approximate span range of 3.1 km for single mode and 2.2 km for multimode fiber. Each end of the optical facility must have the same coded OLIU at both ends.
6. The 25F OLIU is equipped with a 1300-nm laser with an approximate span range of 23 km for single mode and 14.5 km for multimode fiber. Each end of the optical facility must have the same coded OLIU at both ends.
7. The AEK86B repeater is designed to accommodate a maximum loop resistance of 2100 ohms, which will normally accommodate approximately eight repeater sections and 50 kft of 22 AWG PIC cable, and up to 85 ft to the DSX.
8. The AEK88 repeater is designed to accommodate a maximum loop resistance of 300 ohms, which will normally accommodate approximately one repeater section and 9 kft of 22 AWG PIC cable, and up to 85 cable feet to the DSX. It may also be used as an office looping repeater.
9. If protection is not equipped for the 25-type OLIUs, it is then recommended that two AEK39 BP1 plug-ins be inserted in the unequipped slot to prevent inadvertent insertion of AEK-type repeaters. The AEK39 BP1 is the same plug-in used in unused DS1 positions in the DDM-1000 shelf.
10. To order spare plug-ins refer to the *Individual Plug-In Ordering* section.
11. The AEK90 repeater is designed to accommodate a maximum loop resistance 2100 ohms which will normally accommodate approximately eight repeater sections and 50 kft of 22 AWG PIC cable and up to 655 feet to the DSX-1.

(Fill out one blank per shelf ordered per bay) TEO No.| Section | Page | Date
Typical Bay Arrangement Selected per ED-8C730-10
Relay Rack Number:_____
Refer to Table 8.

Table 7. Shelf Interbay Cable Order Blank for Bay Arrangements (Shelf 1)

Qty Ord	Cable Description (ED-8C730-20)	Enter Group Number (See Note 1)	Enter Length (Feet) if Required	Select No More Than	See Note
	Office Alarm Interface			1	
	Parallel Telemetry Interface			1	2
	Fault Locate Interface			1	
	DDM-Plus to DSX-1			1	
	DDM-Plus to T1 Line			1	3
	Bay Power Mult			1	4

Notes:

1. Select cable group number per Table 8.
2. To accommodate locations where parallel telemetry interfaces are required to remote maintenance centers, each DDM-Plus shelf provides a parallel telemetry port with alarm, system ID, and location information. The parallel telemetry interface cabling should be provided for these applications.
3. When the electrical interface is required (AEK-type repeaters), one cable group is ordered that wires to all T1 interfaces, regardless of the number of T1 lines that will actually interface with the shelf. If some interfaces are to be lightwave (mixed shelf), the unused corresponding electrical cabling provided may be open-ended or terminated in the MDF for possible future copper conversions.
4. The bay power mult cable is designed to be spliced to a central office power feeder. It provides six pairs of danglers (both "A" and "B") to connect the six J98725DB-1 shelves, plus one pair that will be reserved for a future optional Control Interface Shelf. Consult FPD 801-525-169 and T-82046-30 for power feeder requirements (order one group 9 per bay).

Table 8. ED-8C730-20 Group Structure

Cable Description	Number of Inputs	Number of DS1s	Group Number	Length (Feet)	Cable Type	See Note
Office Alarm Interface for Single Shelf	1		10	150	816AS	1
			2	As req'd		2
Parallel Telemetry Interface for Single Shelf	1		23	150	800AS	1
			22	As req'd		2
Fault Locate Interface	1		12	150	812AS	1
			4	As req'd		2
DDM-Plus to DSX-1		28	17	85	613C	1
			18	150		1
			7	As req'd, max 655		2,4
			19	85	1249C	1,3
			20	150		1,3
			8	As req'd, max 450		2,3,4
DDM-Plus to T1 Line		28	13	100	613C	1
			14	200		1
			5	As req'd, max 200		2
			15	100	1249C	1,3
			16	200		1,3
			6	As req'd, max 200		2,3
Bay Power Mult			9	12	10GA	5

Notes:

1. Cable stocked at AT&T MDCs for reduced order interval (1-2 weeks).
2. Order must specify cable length. Order interval approximately 4 weeks.
3. This cable is the recommended cable for these connections.
4. The maximum distance shown for DSX-1 cables is for connection to the 25-type OLIUs or AEK90 repeaters, which provide cable equalization options for specific distances to DSX-1 frame. The maximum distance for AEK-type repeaters, which do not have cable equalization options (AEK86B, AEK88), is 85 feet to the DSX-1 frame.
5. The bay power mult cable is designed to be spliced to a central office power feeder. It provides six pairs of danglers (both "A" and "B") to connect the six J98725DB-1 shelves, plus one pair that will be reserved for a future optional Control Interface Shelf. Consult FPD 801-525-169 and T-82046-30 for power feeder requirements (order one group 9 per bay).

(Fill out one blank per shelf ordered per bay) TEO No.| Section | Page | Date
Typical Bay Arrangement Selected per ED-8C730-10
Relay Rack Number:_____
Refer to Table 10.

Table 9. Shelf Interbay Cable Order Blank for Bay Arrangements (Shelf 2)

Qty Ord	Cable Description (ED-8C730-20)	Enter Group Number (See Note 1)	Enter Length (Feet) if Required	Select No More Than	See Note
	Office Alarm Interface			1	
	Parallel Telemetry Interface			1	2
	Fault Locate Interface			1	
	DDM-Plus to DSX-1			1	
	DDM-Plus to T1 Line			1	3

Notes:

1. Select cable group number per Table 10.
2. To accommodate locations where parallel telemetry interfaces are required to remote maintenance centers, each DDM-Plus shelf provides a parallel telemetry port with a minimum of alarm, system ID, and location information. The parallel telemetry interface cabling should be provided for these applications.
3. When the electrical interface is required (AEK-type repeaters), one cable group is ordered that wires to all T1 interfaces, regardless of the number of T1 lines that will actually interface with the shelf. If some interfaces are to be lightwave (mixed shelf), the unused corresponding electrical cabling provided may be open-ended or terminated in the MDF for possible future copper conversions.

Table 10. ED-8C730-20 Group Structure

Cable Description	Number of Inputs	Number of DS1s	Group Number	Length (Feet)	Cable Type	See Note
Office Alarm Interface for Single Shelf	1		10	150	816AS	1
			2	As req'd		2
Parallel Telemetry Interface for Single Shelf	1		23	150	800AS	1
			22	As req'd		2
Fault Locate Interface	1		12	150	812AS	1
			4	As req'd		2
DDM-Plus to DSX-1		28	17	85	613C	1
			18	150		1
			7	As req'd, max 655		2,4
			19	85	1249C	1,3
			20	150		1,3
			8	As req'd, max 450		2,3,4
DDM-Plus to T1 Line		28	13	100	613C	1
			14	200		1
			5	As req'd, max 200		2
			15	100	1249C	1,3
			16	200		1,3
			6	As req'd, max 200		2,3

Notes:

1. Cable stocked at AT&T MDCs for reduced order interval (1-2 weeks).
2. Order must specify cable length. Order interval approximately 4 weeks.
3. This cable is the recommended cable for these connections.
4. The maximum distance shown for DSX-1 cables is for connection to the 25-type OLIUs or AEK90 repeaters, which provide cable equalization options for specific distances to DSX-1 frame. The maximum distance for AEK-type repeaters, which do not have cable equalization options (AEK86B, AEK88), is 85 feet to the DSX-1 frame.

(Fill out one blank per shelf ordered per bay) TEO No.| Section | Page | Date
Typical Bay Arrangement Selected per ED-8C730-10
Relay Rack Number:_____
Refer to Table 12.

Table 11. Shelf Interbay Cable Order Blank for Bay Arrangements (Shelf 3)

Qty Ord	Cable Description (ED-8C730-20)	Enter Group Number (See Note 1)	Enter Length (Feet) if Required	Select No More Than	See Note
	Office Alarm Interface			1	
	Parallel Telemetry Interface			1	2
	Fault Locate Interface			1	
	DDM-Plus to DSX-1			1	
	DDM-Plus to T1 Line			1	3

Notes:

1. Select cable group number per Table 12.
2. To accommodate locations where parallel telemetry interfaces are required to remote maintenance centers, each DDM-Plus shelf provides a parallel telemetry port with a minimum of alarm, system ID, and location information. The parallel telemetry interface cabling should be provided for these applications.
3. When the electrical interface is required (AEK-type repeaters), one cable group is ordered that wires to all T1 interfaces, regardless of the number of T1 lines that will actually interface with the shelf. If some interfaces are to be lightwave (mixed shelf), the unused corresponding electrical cabling provided may be open-ended or terminated in the MDF for possible future copper conversions.

Table 12. ED-8C730-20 Group Structure

Cable Description	Number of Inputs	Number of DS1s	Group Number	Length (Feet)	Cable Type	See Note
Office Alarm Interface for Single Shelf	1		10	150	816AS	1
			2	As req'd		2
Parallel Telemetry Interface for Single Shelf	1		23	150	800AS	1
			22	As req'd		2
Fault Locate Interface	1		12	150	812AS	1
			4	As req'd		2
DDM-Plus to DSX-1		28	17	85	613C	1
			18	150		1
			7	As req'd, max 655		2,4
			19	85	1249C	1,3
			20	150		1,3
			8	As req'd, max 450		2,3,4
DDM-Plus to T1 Line		28	13	100	613C	1
			14	200		1
			5	As req'd, max 200		2
			15	100	1249C	1,3
			16	200		1,3
			6	As req'd, max 200		2,3

Notes:

1. Cable stocked at AT&T MDCs for reduced order interval (1-2 weeks).
2. Order must specify cable length. Order interval approximately 4 weeks.
3. This cable is the recommended cable for these connections.
4. The maximum distance shown for DSX-1 cables is for connection to the 25-type OLIUs or AEK90 repeaters, which provide cable equalization options for specific distances to DSX-1 frame. The maximum distance for AEK-type repeaters, which do not have cable equalization options (AEK86B, AEK88), is 85 feet to the DSX-1 frame.

(Fill out one blank per shelf ordered per bay) TEO No.| Section | Page | Date
Typical Bay Arrangement Selected per ED-8C730-10
Relay Rack Number:_____
Refer to Table 14.

Table 13. Shelf Interbay Cable Order Blank for Bay Arrangements (Shelf 4)

Qty Ord	Cable Description (ED-8C730-20)	Enter Group Number (See Note 1)	Enter Length (Feet) if Required	Select No More Than	See Note
	Office Alarm Interface			1	
	Parallel Telemetry Interface			1	2
	Fault Locate Interface			1	
	DDM-Plus to DSX-1			1	
	DDM-Plus to T1 Line			1	3

Notes:

1. Select cable group number per Table 14.
2. To accommodate locations where parallel telemetry interfaces are required to remote maintenance centers, each DDM-Plus shelf provides a parallel telemetry port with a minimum of alarm, system ID, and location information. The parallel telemetry interface cabling should be provided for these applications.
3. When the electrical interface is required (AEK-type repeaters), one cable group is ordered that wires to all T1 interfaces, regardless of the number of T1 lines that will actually interface with the shelf. If some interfaces are to be lightwave (mixed shelf), the unused corresponding electrical cabling provided may be open-ended or terminated in the MDF for possible future copper conversions.

Table 14. ED-8C730-20 Group Structure

Cable Description	Number of Inputs	Number of DS1s	Group Number	Length (Feet)	Cable Type	See Note
Office Alarm Interface for Single Shelf	1		10	150	816AS	1
			2	As req'd		2
Parallel Telemetry Interface for Single Shelf	1		23	150	800AS	1
			22	As req'd		2
Fault Locate Interface	1		12	150	812AS	1
			4	As req'd		2
DDM-Plus to DSX-1		28	17	85	613C	1
			18	150		1
			7	As req'd, max 655		2,4
			19	85	1249C	1,3
			20	150		1,3
			8	As req'd, max 450		2,3,4
DDM-Plus to T1 Line		28	13	100	613C	1
			14	200		1
			5	As req'd, max 200		2
			15	100	1249C	1,3
			16	200		1,3
			6	As req'd, max 200		2,3

Notes:

1. Cable stocked at AT&T MDCs for reduced order interval (1-2 weeks).
2. Order must specify cable length. Order interval approximately 4 weeks.
3. This cable is the recommended cable for these connections.
4. The maximum distance shown for DSX-1 cables is for connection to the 25-type OLIUs or AEK90 repeaters, which provide cable equalization options for specific distances to DSX-1 frame. The maximum distance for AEK-type repeaters, which do not have cable equalization options (AEK86B, AEK88), is 85 feet to the DSX-1 frame.

(Fill out one blank per shelf ordered per bay) TEO No.| Section | Page | Date
Typical Bay Arrangement Selected per ED-8C730-10
Relay Rack Number:_____
Refer to Table 16.

Table 15. Shelf Interbay Cable Order Blank for Bay Arrangements (Shelf 5)

Qty Ord	Cable Description (ED-8C730-20)	Enter Group Number (See Note 1)	Enter Length (Feet) if Required	Select No More Than	See Note
	Office Alarm Interface			1	
	Parallel Telemetry Interface			1	2
	Fault Locate Interface			1	
	DDM-Plus to DSX-1			1	
	DDM-Plus to T1 Line			1	3

Notes:

1. Select cable group number per Table 16.
2. To accommodate locations where parallel telemetry interfaces are required to remote maintenance centers, each DDM-Plus shelf provides a parallel telemetry port with a minimum of alarm, system ID, and location information. The parallel telemetry interface cabling should be provided for these applications.
3. When the electrical interface is required (AEK-type repeaters), one cable group is ordered that wires to all T1 interfaces, regardless of the number of T1 lines that will actually interface with the shelf. If some interfaces are to be lightwave (mixed shelf), the unused corresponding electrical cabling provided may be open-ended or terminated in the MDF for possible future copper conversions.

Table 16. ED-8C730-20 Group Structure

Cable Description	Number of Inputs	Number of DS1s	Group Number	Length (Feet)	Cable Type	See Note
Office Alarm Interface for Single Shelf	1		10	150	816AS	1
			2	As req'd		2
Parallel Telemetry Interface for Single Shelf	1		23	150	800AS	1
			22	As req'd		2
Fault Locate Interface	1		12	150	812AS	1
			4	As req'd		2
DDM-Plus to DSX-1		28	17	85	613C	1
			18	150		1
			7	As req'd, max 655		2,4
			19	85	1249C	1,3
			20	150		1,3
			8	As req'd, max 450		2,3,4
DDM-Plus to T1 Line		28	13	100	613C	1
			14	200		1
			5	As req'd, max 200		2
			15	100	1249C	1,3
			16	200		1,3
			6	As req'd, max 200		2,3

Notes:

1. Cable stocked at AT&T MDCs for reduced order interval (1-2 weeks).
2. Order must specify cable length. Order interval approximately 4 weeks.
3. This cable is the recommended cable for these connections.
4. The maximum distance shown for DSX-1 cables is for connection to the 25-type OLIUs or AEK90 repeaters, which provide cable equalization options for specific distances to DSX-1 frame. The maximum distance for AEK-type repeaters, which do not have cable equalization options (AEK86B, AEK88), is 85 feet to the DSX-1 frame.

(Fill out one blank per shelf ordered per bay) TEO No.| Section | Page | Date
Typical Bay Arrangement Selected per ED-8C730-10
Relay Rack Number:_____
Refer to Table 18.

Table 17. Shelf Interbay Cable Order Blank for Bay Arrangements (Shelf 6)

Qty Ord	Cable Description (ED-8C730-20)	Enter Group Number (See Note 1)	Enter Length (Feet) if Required	Select No More Than	See Note
	Office Alarm Interface			1	
	Parallel Telemetry Interface			1	2
	Fault Locate Interface			1	
	DDM-Plus to DSX-1			1	
	DDM-Plus to T1 Line			1	3

Notes:

1. Select cable group number per Table 18.
2. To accommodate locations where parallel telemetry interfaces are required to remote maintenance centers, each DDM-Plus shelf provides a parallel telemetry port with a minimum of alarm, system ID, and location information. The parallel telemetry interface cabling should be provided for these applications.
3. When the electrical interface is required (AEK-type repeaters), one cable group is ordered that wires to all T1 interfaces, regardless of the number of T1 lines that will actually interface with the shelf. If some interfaces are to be lightwave (mixed shelf), the unused corresponding electrical cabling provided may be open-ended or terminated in the MDF for possible future copper conversions.

Table 18. ED-8C730-20 Group Structure

Cable Description	Number of Inputs	Number of DS1s	Group Number	Length (Feet)	Cable Type	See Note
Office Alarm Interface for Single Shelf	1		10	150	816AS	1
			2	As req'd		2
Parallel Telemetry Interface for Single Shelf	1		23	150	800AS	1
			22	As req'd		2
Fault Locate Interface	1		12	150	812AS	1
			4	As req'd		2
DDM-Plus to DSX-1		28	17	85	613C	1
			18	150		1
			7	As req'd, max 655		2,4
			19	85	1249C	1,3
			20	150		1,3
			8	As req'd, max 450		2,3,4
DDM-Plus to T1 Line		28	13	100	613C	1
			14	200		1
			5	As req'd, max 200		2
			15	100	1249C	1,3
			16	200		1,3
			6	As req'd, max 200		2,3

Notes:

1. Cable stocked at AT&T MDCs for reduced order interval (1-2 weeks).
2. Order must specify cable length. Order interval approximately 4 weeks.
3. This cable is the recommended cable for these connections.
4. The maximum distance shown for DSX-1 cables is for connection to the 25-type OLIUs or AEK90 repeaters, which provide cable equalization options for specific distances to DSX-1 frame. The maximum distance for AEK-type repeaters, which do not have cable equalization options (AEK86B, AEK88), is 85 feet to the DSX-1 frame.

4. DDM-Plus Wall Distant Terminal Ordering

This section covers ordering information for the DDM-Plus Wall Distant Terminal (DT). Before getting into the ordering sections, a brief description of the DDM-Plus Wall DT is presented below.

The Wall DT is a compact housing that can be wall mounted or simply placed on a table or desk top. The Wall DT can accommodate four DS1 signals, with or without protection. A shelf arranged with protection requires four fiber interfaces and two 25-type optical line interface units (OLIUs). Without protection, two fiber interfaces are required and one 25-type OLIU. The shelf cannot be configured to accommodate two unprotected optical lines. Unlike the J98725DB-1, List 1, Extension Shelf, no copper T1 interfaces are available.

The Wall DT shelf is powered by –48 V DC. When central office-like batteries are available, "A" and "B" sources are recommended. Although not part of the Wall DT equipment, two other battery sources designed to interface with commercial AC power have been operated with the Wall DT, one with 8-hour battery backup and another with no backup. These are described in more detail in the *Miscellaneous Equipment and Tools* section.

The Wall DT, plug-ins, and cabling assemblies are stocked in AT&T Material Distribution Centers (MDCs) for short ordering intervals.

DDM-Plus ED-8C730-33 Wall Distant Terminal*

The order forms shown in Table 19 provide ordering information for ED-8C730-33 Wall DTs. In addition, Wall DTs may be ordered with certain quantities of plug-ins, as shown in Table 19.

* The ED-8C730-33 Wall DT replaces the ED-8C730-30 Wall DT. If current engineering is required for the ED-8C730-30 Wall DT, consult the appropriate drawings listed in Table 1.

Table 19. Wall Distant Terminal Order Blank

Qty Ord	Equipment Code	Equipment Furnished with Group Ordered: Distant Terminal	25A OLIU	25F OLIU	See Note	Description
	ED-8C730-33,G1	1				Unequipped Shelf
	ED-8C732-32,G3		1		1	Order 1 for 1 unprotected optical line
	ED-8C732-32,G4			1	2	Order 2 for 1 protected optical line
	ED-8C732-32,G11	1			3	Unequipped Shelf
	ED-8C732-32,G12	1	2		1	Fully equipped shelf with 780-nm OLIUs
	ED-8C732-32,G13	1		2	2	Fully equipped shelf 1300-nm OLIUs

Notes:

1. The 25A OLIU is equipped with a 780-nm laser with an approximate span of 3.1 km for single mode and 2.2 km for multimode fiber. Each end of the optical facility must have the same coded OLIU.
2. The 25F OLIU is equipped with a 1300-nm laser with an approximate span of 23 km for single mode and 14.5 km for multimode fiber. Each end of the optical facility must have the same coded OLIU.
3. Groups 7, 8, and 9 have been replaced by Groups 11, 12, and 13 equipped with the ED-8C730-33 shelf, which replaces the ED-8C730-30 shelf. *CLEI** codes for the ED-8C730-30 and ED-8C730-33 are DMMYAAXLAA and T1MRJL04RB, respectively.

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DDM-Plus Wall Distant Terminal Cable Ordering

Cable orders for the ED-8C730-33 Wall DT are covered in Table 20.

(Provide one blank per shelf ordered) TEO No.| Section | Page | Date
Refer to Table 21.

Table 20. Cable Order Blank for Wall Distant Terminal ED-8C730-33

Qty Ord	Cable Description (ED-8C730-30)	Enter Group Number (See Note 1)	Enter Length (Feet) if Required	Select No More Than	See Note
—	Power Cable	—	—	1	2
	Office Alarm Interface			1	3
	Parallel Telemetry Interface			1	4
	Miscellaneous Discrete Input			1	5
	DDM-Plus to DSX-1			4	6
—	Building Ground Cable	—	—	1	7

Notes:

1. Select cable group per Table 21.
2. The Wall DT is designed to operate from two –48 V DC sources. At locations where centralized –48 V battery is available, two –48 V sources (A and B) should be provided. The power feeders for these arrangements should be job engineered in accordance with T82046-30, Battery Distribution Drawing, and the power information provided on FPD 801-525-169. The maximum size cable that can connect to the Wall DT –48 V terminal block is 14 AWG. A minimum of 18 AWG cable is required to ensure secure connections. When centralized –48 V battery is not available, there are many AC-to-DC converters (protected and unprotected) that can provide –48 V from local AC sources. Two such converters have been tested and approved for use with the Wall DT and are listed in the *Miscellaneous Equipment and Tools* section.
3. If the Wall DT location requires in-building remote alarms (similar to central office audible/visual), two closures (minor and major) are provided. These closures are designed for a maximum open circuit output voltage of 60 volts, a transient voltage up to 135 volts for a maximum of 1 ms, and a maximum steady-state current of 1 ampere.
4. At some Wall DT locations equipped with E2A-like telemetry (for example, the AT&T Digital Alarm Scanner), it may be desirable to include the parallel telemetry output to an OS. This output provides status indications for major alarm, minor alarm, near-end activity, far-end activity, one miscellaneous discrete, as well as system ID. The telemetry output is designed for a maximum open circuit voltage of 60 volts, a transient voltage of up to 135 volts for a maximum of 1 ms, and a maximum steady-state current of 35 mA.
5. One miscellaneous discrete point is available as an input from a dry-closure (for example, power alarm, open door, etc.), which appears in the parallel telemetry output as the miscellaneous discrete status at the far-end.
6. One cable required per each DS1.
7. A 14 AWG insulated copper wire must be connected from TB 1 terminal block **FRM GRD** to a solid building ground (such as a cold water pipe) and should not exceed 6 feet in length.

Table 21. ED-8C730-30 Group Structure for ED-8C730-33 Wall DT

Cable Description	Number of Inputs	Group Number	Length (Feet)	Cable Type	Note
Office Alarm Interface for Wall DT	1	33	150	816AS	1
		32	As req'd		2
Parallel Telemetry Interface for Wall DT	1	37	75	816AS	1
		36	As req'd		2
Miscellaneous Discrete Input	1	35	150	812AS	1
		34	As req'd		2
DDM-Plus to DSX-1	1	29	40	KS22487,L105	1,3
		28	As req'd, max 450		2, 3

Notes:

1. Cables stocked at AT&T MDCs for reduced order interval (1-2 weeks).
2. Order must specify cable length. Order interval approximately 4 weeks.
3. One end of the DSX cable is terminated in 8-pin modular plugs; the other end is open ended. The open end may, of course, connect directly to DS1 equipment if no DSX-1 panel is furnished.

5. Individual Plug-In Ordering

This section provides an order blank, Table 25, for individual plug-in orders. It also includes sparing recommendations based on reliability projections for each plug-in unit. Before describing the plug-in ordering, a brief description of the shelf layout and plug-ins is in order.

The J98725DB-1, List 1, DDM-Plus shelf can accommodate various mixes of 25-type OLIU fiber interfaces and AEK-type copper interfaces, for a maximum of 28 DS1s. Referring to Figure 2, there are 28 slots numbered on the lower faceplate. If a shelf was completely occupied by AEK-type repeaters, those numbers would identify each of the 28 DS1s individually transmitted over copper facilities. On the upper faceplate, the labeling is organized for optical interfaces, where groups of four slots are broken up into 7 groups, A through G. Since each 25-type plug-in occupies two slots (and accommodates four DS1s over a pair of fibers), one 25-type OLIU in the OL-A1 position will provide unprotected transmission for four DS1s. If protection is desired, a second 25-type OLIU is required in the OL-A2 position, thus occupying all four slots in the "A Group." Therefore, if the shelf is to be fully equipped with optical units with protection, fourteen 25-type OLIUs are required. In one group, the same type of OLIU must be furnished, and no AEK-type repeaters can be used in the unused slots if protection is not provided; that is, 25-type OLIUs and AEK-type repeaters cannot be used in the same lettered group. If protection is not provided for the 25-type OLIUs, it is recommended that two AEK39 BP1 plug-ins be inserted in the protection slot to prevent inadvertent insertion of an AEK-type repeater, which could cause service degradation. If the shelf is to be used for both fiber and copper interfaces, OLIUs must grow from left-to-right and AEKs grow from right-to-left.

The ED-8C730-31, Group 1 Wall DT can accommodate either one or two 25-type OLIU fiber interfaces (unprotected or protected, respectively) for a maximum of four DS1s. It cannot interface with T1 copper facilities.

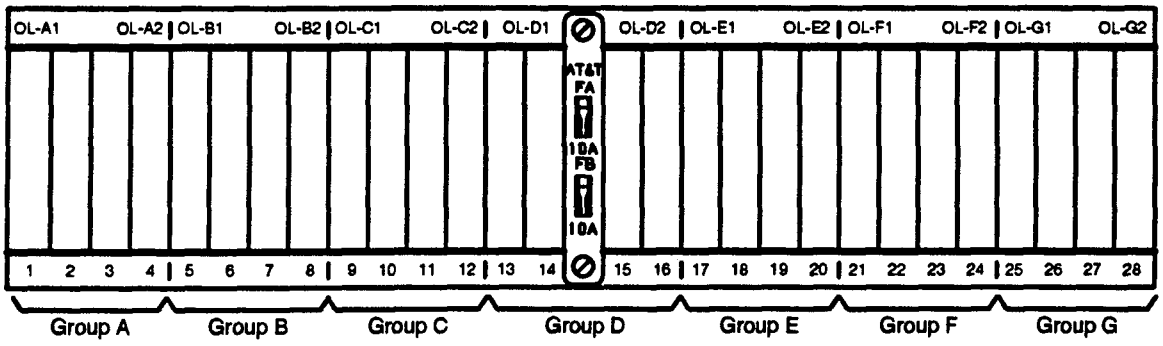

Figure 2. DDM-Plus J98725DB-1 Extension Shelf Circuit Pack Groups

Plug-In Maintenance Sparing Guidelines

Table 22 provides a guideline for determining the number of DDM-Plus plug-in spares needed for a given number of plug-ins in the field. The sparing guide serves as an initial estimate and is calculated with the following assumptions:

- The method for calculating spares follows the procedure described in Bellcore SR-TSY-000385, Draft, Issue 1.
- The steady-state failure rate is assumed. Failure rates are based on the RPP method described in TR-TSY-000332, Issue 3.
- The spare availability objective (SAO) is 99 percent. The SAO is the long-term probability that a spare plug-in is available when it is needed.
- A no-trouble-found (NTF) factor of 1.67 is multiplied to the failure rate. This accounts for replacements of plug-ins when actually no failure has occurred. The NTF factor is expected to approach 1.25 as the product matures. The likelihood of an NTF decreases as the product matures, and sparing needs will, therefore, diminish over time.
- Turnaround time of a returned plug-in is 4 weeks.

The Plug-In Order Blank in Table 23 provides ordering information for individual plug-ins. The following table reflects the plug-in population that may be supported by the number of spares.

Table 22. Sparing Guidelines

Plug-In Code	Number of Spares 1	2	3	4	5	6
25A OLIU	13	37	70	109	152	198
25F OLIU	12	35	66	103	143	187
AEK86 RPTR	120	350	700	1000	1500	2000
AEK88 RPTR	140	400	800	1200	1500	2200
AEK90 RPTR	92	270	510	793	1106	1444

EXAMPLE:

- Apparatus Code = 25A OLIU
- Plug-in population = between 38 and 70
- Number of spares = 3

Table 23. DDM-Plus Plug-In Order Blank

Qty Ord	Product Code	CLEI* Code	Functional Name	Functional Designation	Maximum Number Required Per Shelf	Minimum Required for Shelf Functionality (Note 1)	See Note
	25A Regen (OLIU)	DMDHA36AAA	Optical Line Interface Unit	OLIU	†	2	2
	25F Regen (OLIU)	DMDHA46AAA	Optical Line Interface Unit	OLIU	†	2	3
	AEK86B Repeater	T1R3BCBAAB	T1 Repeater	RPTR	†	1	4
	AEK88 Repeater	T1R2GB0KAA	T1 Repeater (low power)	RPTR	†	1	5
	AEK90 Repeater	T1R2FB0KAA	T1 Repeater	RPTR	†	1	6

Notes:

1. Minimum functionality includes protection switching capability; thus protection plug-ins are included. If protection is not provided for the 25-type OLIUs, it is recommended that two AEK39 BP1 plug-ins be inserted in the protection slot to prevent insertion of AEK-type repeaters. The AEK39 BP1 is inserted in unused DS1 positions in the DDM-1000 shelf.
2. The 25A OLIU is equipped with a 780-nm laser with an approximate span range of 3.1 km for single mode and 2.2 km for multimode fiber. Each end of the optical facility must have the same coded OLIU at both ends.
3. The 25F OLIU is equipped with a 1300-nm laser with an approximate span range of 23 km for single mode and 14.5 km for multimode fiber. Each end of the optical facility must have the same coded OLIU at both ends.
4. The AEK86B repeater is designed to accommodate a maximum loop resistance of 2100 ohms, which will normally accommodate approximately eight repeater sections and 50 kft of 22 AWG PIC cable. It can accommodate a maximum of 85 feet to the DSX-1.
5. The AEK88 repeater is designed to accommodate a maximum loop resistance of 300 ohms, which will normally accommodate approximately one repeater section and 9 kft of 22 AWG PIC cable. It can accommodate a maximum of 85 feet to the DSX-1.
6. The AEK90 repeater is designed to accommodate a maximum loop resistance of 2100 ohms, which will normally accommodate eight repeater sections and 50 kft of 22 AWG PIC cable. It also provides cable equalization in 5 ranges of up to 655 feet to the DSX-1.

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† Since these plug-in units can occupy any of the J98725DB-1 shelf slots, the maximum number per shelf will depend upon the configuration. If the shelf is to be totally fiber interfaces, a maximum of fourteen 25-type OLIUs is required. If the shelf is to be totally copper interfaces, a maximum of 28 AEK-type repeaters is required. For every 25-type OLIU furnished in a group, the maximum number of AEK-type repeaters is reduced by four. For mixed shelf operations, it is recommended that OLIU plug-ins grow from left-to-right and AEK-type plug-ins grow from right-to-left.

6. Miscellaneous Equipment and Tools

This section lists equipment and tools that may prove to be helpful with a DDM-Plus. Although DDM-Plus was designed with built-in self-test capability for facilitating installation and normal maintenance routines and troubleshooting, certain ancillary equipment and tools may be useful to installers and maintenance personnel to aid in installation and testing. Table 24 lists the items with recommended quantities per central office. Many of these items may already be a part of normal central office equipment.

Table 24. DDM-Plus Miscellaneous Equipment and Tools

Description	Code	Minimum Quantities Rcmnd/CO	See Note
Lightguide Jumper	FS1E-E-02 (Comcode 105-357-727)	2	1,2
Strap, wrist > 6-1/2" circumference	Comcode 901011320	See Note 3	3,4
Strap, wrist < 6-1/2" circumference	Comcode 900557075	See Note 3	3,4
Terminal, ESD grounding	Comcode 845264118	See Note 4	4
Fuse, 10 amp (J98725DB-1 shelf)	See Note 5	See Note 5	5
Fuse, 0.5 amp, 60 V DC (Wall DT)	BUSS Type GMT HK Series	See Note 8	8
Fiber Optic Cable *ST*®-to-Biconic (4 ft.)	Comcode 105420913	2	1,6
Microduster Air (12 cans), or equivalent	Comcode 900709361	1	7
Microduster Nozzle Asby., or equivalent	Comcode 900709338		
Absorbond Cleaner (Pkg.), or equivalent	Comcode 900709379		
–48 V Power Supply for Wall DT Applications (120 V AC/48 V DC, unprotected)	Comcode 106705288	1	9
–48 V Power Supply for Wall DT Applications (120 V AC/48 V DC, protected)	Comcode 106692999	1	9
–48 V 5 ampere-hour battery	Comcode 405790734	See Note 9	10

See notes on the following page.

Table 24. DDM-Plus Miscellaneous Equipment and Tools (Contd)

Notes:

1. Equipment noted is not required for normal maintenance routines but may be helpful for installation and troubleshooting testing.
2. Lightguide jumper noted is a 2-foot *ST*-to-*ST* connectorized cable, which can be used for a manual optical loopback at the OLIU plug-in interface.
3. It is recommended that one wrist strap be provided for each DDM-Plus bay arrangement for protection against plug-in damage resulting from electrostatic discharge.
4. Each DDM-Plus shelf comes equipped with an electrostatic discharge (ESD) jack on the front panel for ESD wrist straps (see Note 3). ESD grounding terminals may be also mounted miscellaneously in unused #12-24 tapped holes in typical bay framework. If rear access activities are anticipated, at least one of these terminals is recommended for rear access bay mounting.
5. The two –48 V feeders (A and B) required for each DDM-Plus shelf are protected by 10-amp fuses that ship with the shelf. A box of five spare fuses also ships with the shelf. Additional fuses may be ordered through AT&T using Comcode 406203190 (5 ea/per box).
6. Lightguide connectors at the OLIU plug-in interface are *ST* type. If interfaces for testing, etc., to biconic entities are required, the specified adapter, or equivalent, may be utilized.
7. It is very important that optical fiber connections be cleaned thoroughly whenever they are removed and reconnected to avoid potentially service-affecting optical losses. Consult the *Operation and Maintenance Task Oriented Practice (TOP)* chapter in AT&T 363-206-150, *DDM-Plus User/Service Manual* for proper cleaning procedures.
8. Four spare fuses are shipped with each Wall DT. Additional spares may be commercially obtained by referencing the BUSS code and rating listed.
9. This unit is a kit that includes all equipment required for immediate power turnup following installation. An instruction manual accompanies the kit (Comcode 846855278).
10. Batteries are stocked at AT&T distribution locations, and orders are normally filled within 24 hours of receipt, maximum interval 2 weeks. It is not normally recommended that batteries be stored locally as spares because extended periods of shelf storage could lead to battery deterioration. All batteries are dated for recommended usage. Minimum battery life is normally 4 years, assuming ambient operating temperature within a range of +20°C to +40°C.

Lightguide Jumper

The DDM-Plus lightguide interface can be either single mode or multimode. When the outside plant lightguide is single mode, single mode jumpers are recommended for interfacing between the *LGX*® panel and the DDM-Plus equipment; however, it is permissible to use multimode jumpers from the receive portion of the *LGX* panel to the DDM-Plus receive input. When the outside plant lightguide is multimode, multimode fiber jumpers must be used between the *LGX* panel and the DDM-Plus equipment on both transmit and receive section. Two transmit and two receive lightguide fibers are required for each protected DDM-Plus OLIU group; thus, a maximum of 14 transmit and 14 receive fibers are required for a fully equipped shelf with protection. The fiber connector interface at the DDM-Plus OLIU is the *ST*-type. The connector type at the *LGX* panel may vary. Two types of lightguide jumpers can be ordered from AT&T. Single mode jumpers are listed in Table 25, and multimode jumpers are listed in Table 26. Variable lengths can also be ordered by calling 1-800-344-0223.

Table 25. Single Mode Lightguide Jumpers

Code	Comcode	Description	Length (Feet)	Connectors
FS1E-E-10	105357768	Lightguide Jumper	10	*ST*®-*ST*
FS1E-E-25	105357800	Lightguide Jumper	25	*ST-ST*
FS1E-E-50	105357859	Lightguide Jumper	50	*ST-ST*
FS1E-E-100	105357875	Lightguide Jumper	100	*ST-ST*
FS1E-A-10	105420947	Lightguide Jumper	10	*ST*-2016A Biconic
FS1E-A-25	105423958	Lightguide Jumper	25	*ST*-2016A Biconic
FS1E-A-50	105424006	Lightguide Jumper	50	*ST*-2016A Biconic
FS1E-A-100	105424022	Lightguide Jumper	100	*ST*-2016A Biconic

Table 26. Multimode Lightguide Jumpers

Code	Comcode	Description	Length (Feet)	Connectors
FL1E-E-10	105351837	Lightguide Jumper	10	*ST®-ST*
FL1E-E-25	105351860	Lightguide Jumper	25	*ST-ST*
FL1E-E-50	105351910	Lightguide Jumper	50	*ST-ST*
FL1E-E-100	105351936	Lightguide Jumper	100	*ST-ST*
FL1E-A-10	105613988	Lightguide Jumper	10	*ST*-2016A Biconic
FL1E-A-25	105614010	Lightguide Jumper	25	*ST*-2016A Biconic
FL1E-A-50	105614051	Lightguide Jumper	50	*ST*-2016A Biconic
FL1E-A-100	10614119	Lightguide Jumper	100	*ST*-2016A Biconic

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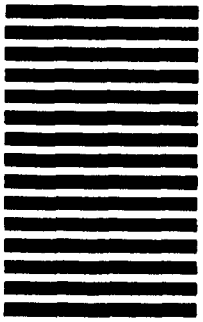

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