

DIGITAL DISTRIBUTION EQUIPMENT

**DTDF 0003
INSTALLATION OPERATION
&
MAINTENANCE MANUAL
ISSUE 1/2000**

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§ 1. Information & General Description

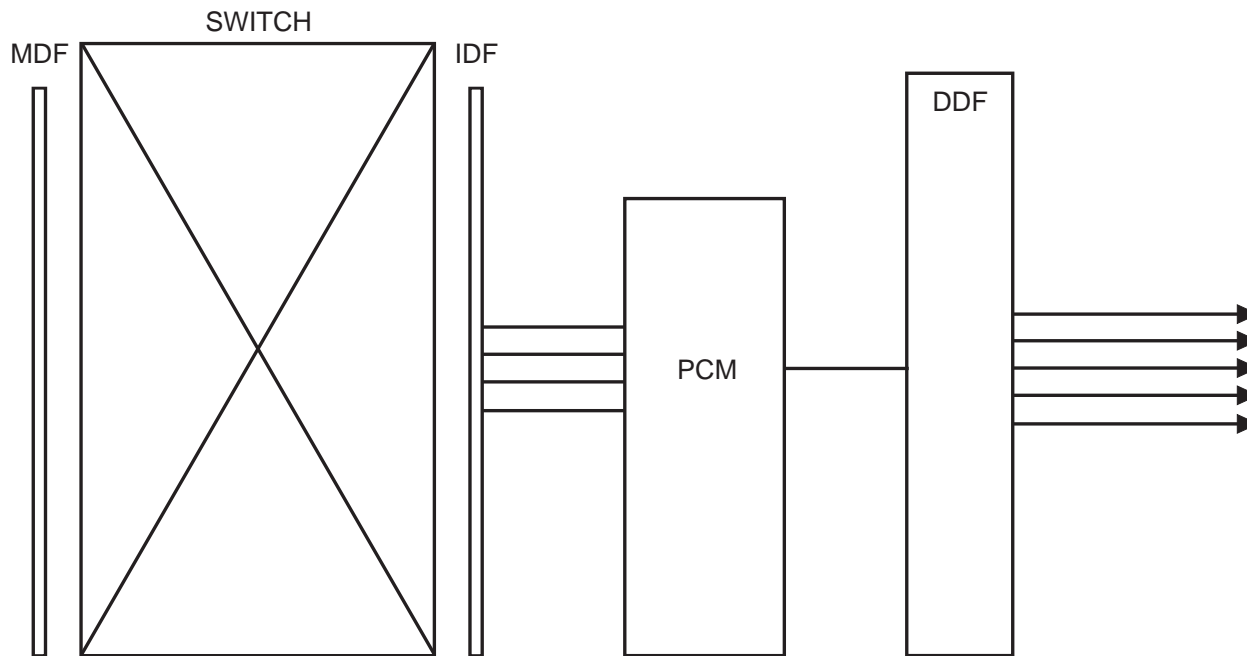
1.0 Introduction

The DDF Installation, operations & maintenance manual provides necessary information for Configuration, Type and installation of Digital Distribution Frames. We feel the guide shall provide inputs for easy installation, handling & up keep of DDF equipment in the field.

We request any suggestion which become useful for field units.

1.1 Equipment Configuration : There are three type of DDF modules which are detailed as under and described in detail in forth coming chapters.

- a. 2Mb DDF module (120 W) -----> Used for terminating 2 Mb circuits. Each module have capacity of 8T/8R terminations. i.e. 8 PCM Systems.
Model No. DDM - 120A
- b.1 8/34 Mb DDF module (75 W) -----> Used for terminating 8Mb/34Mb circuits. Each module have capacity of 4T/4R terminations.
Model DDM 74AA
- b.2 140/155 Mb DDF module (75 W) -----> Used for terminating 140Mb/155Mb circuits. Each module have capacity of 4T/4R terminations.
Model DDM 75BA
- c. Composite 2 Mb/8Mb module -----> This module is used for terminating any combination of 2Mb/8Mb circuits. Each module has a capacity of 4T/4R termination of 2Mb & 2T/2R termination of 8Mb.
Model No. DDM - 120/75A
- d. Bay frame or Slim Rack size 2750 x 120 x 225 — —> Used for terminating all type of modules as described in A, B & C.
or 2100 x 120 x 225 mm
Model No. DDF - 002
The capacity of each Bay frame is to accept 8 Nos of either type of module



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			TITLE	USAGE OF DDF
			DRAWN	DRAWING NO.
REVISION			CHECKED	
1	2	3	APPROVED	DT-DDF-001A

§ 2. Equipment Configuration and Module Description

2.1 Description of DDF

As explained in para 1.2, there are three types of DDF modules. Each type of DDF module is explained in following paras which describe the construction, function, wiring and application of each module.

2.1.1.2 Mb DDF module (120 W) - Model No. DDM - 120A

2.1.1.1 Application

2 Mb DDF module is used for terminating, distributing and cross patching 2 Mb circuits coming from/going to S/W systems, primary multiplexers, cabling systems, distant signaling systems or multiplexers. It provides facility of termination of incoming and outgoing 2Mb circuits, testing, Isolation and cross patching the I/C and O/G termination cables without need for changing wrapping of I/C and O/G cables.

Therefore 2Mb DDF module provides flexibility of design in S/W and/or TRANSMISSION room and provides easy monitoring of 2Mb circuits.

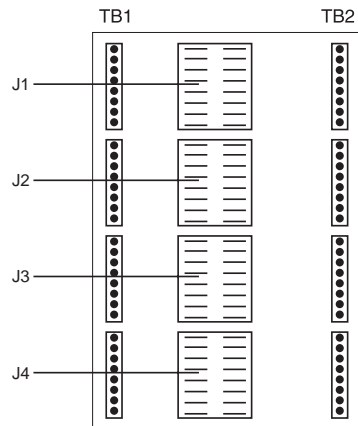
2.1.1.2 Construction

The 2Mb (120W) DDM is PCB based connecting panel. It consists of following :-

- (a) Metal fitting assembly for mounting PCB.
- (b) 2.4mm PCB with provision for accepting Jack/U links used for isolation and testing and wrapping pin connectors for incoming/outgoing termination cables.
- (c) Labels for marking.
- (d) A dust cover protecting entry of dust, lizards etc.

The size of 2Mb (120W) DDM is 120 x 250 mm overall dimension and it is directly mountable on Bat frame or slim rack with the help of the screws from the top (Fig. DT - DDF - 002, 003, 004 & 011).

2.1.1.3 Layout and Usage



The 2Mb module (120W) is a PCB based connecting panel. The PCB used have 16 pin header or wire wrapping Tag blocks namely TB1 - TB8. The incoming circuit thru 10 pairs/ 16pairs HF screen cable of suitable type, are terminated on TB1, TB3, TB5, TB7. The outgoing circuits are taken thru TB2, TB4, TB6, TB8.

There is a Plug and Jack arrangement between TB1-TB2, TB3-TB4, TB5-TB6, TB7-TB8 which are used for isolation/testing and thru circuit testing. Thus for changing assignment of I/C and O/G circuit cables, only Jumpering between respective tag blocks need to be changed an 2Mb (120ohm) DDF module provide flexibility of design.

2.1.1.4 Cable Used

Following cables are used with this type of modules as under :-

Module Type	Cables Type	Vendors/TAC
1. 2Mb DDF Module (120W)	10 Pair HF screen cable as per specs.	- Several Udyog, New Delhi - Bhansali Cables, New Delhi TAC shall be provided

2.1.2.1 Application

8/34Mb module (75W) is used for terminating, distributing and cross patching 8 or 34 Mb circuits (as the case may be) from and to higher order multiplex equipment. This module provides facility of termination, testing, isolation and self loop of 8/34 Mb circuit and therefor provides easy monitoring of 8/34 Mb circuit.

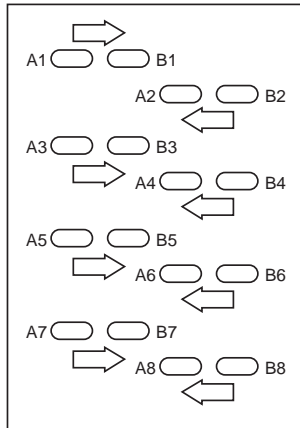
2.1.2.2 Construction

8/34 Mb (75W) DDM is a metal plate based connecting panel. It consist of following:-

- (a) Metal fitting assembly including mounting plate for housing C0-Ax connectors and U links.

- (b) COAX connectors /U links of CACT approved connectors of type P5544 and suitable U links/BNC connectors.
- (c) Labels for marking the connectors/cables.
- (d) Dust covers for protecting entry of dust/lizard etc.

The size of 8/34 Mb (75W) DDM of 250 x 120mm overall dimension and is directly mountable on Bay frame or slim rack with the help of mounting screws in the holes provided in Bay frame.



2.1.2.3 Layout and Usage

The metal plate of 8/34 Mb DDF module (75W) have 16 COAX receptacles namely A1-A8 & B1-B8.

When the U link is placed across A1-B1, it connects the circuit thru by connecting I/C and O/G cables.

For self loop the U link is connected between A1-A2 or B1-B2.

The incoming and outgoing circuit are connected thru RG59 cable to the connectors by preparing of cable and connectorisation (Ref. Fig. DT-DDF-005A & 006A).

For monitoring of circuit, the U link is removed and incoming and outgoing circuits are tested separately.

2.1.2.4 Cables Used

Following cables are used with this type of modules as under :-

Module Type	Cables Type	Vendors/TAC
1. 8/34Mb DDF Module (75W)	RG 59 Single Screen cable as per specs.	- Several Udyog, New Delhi - Bhansali Cables, New Delhi TAC shall be provided

2.1.3 140/155 Mb module (75W) - Model No. DDM 75BA

2.1.3.1 Application

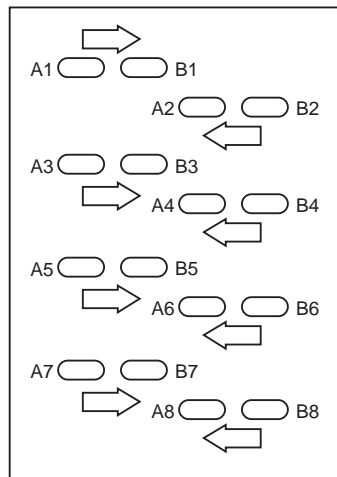
140/155 Mb module (75W) is used for termination, distributing and cross patching 140 or 155Mb circuits (as the case may be) from and to higher order multiplex equipment. This module provides facility of termination, testing, isolation and self loop of 140/155 Mb circuits and therefore provides easy monitoring of 140/155 Mb circuits.

2.1.3.2 Construction

140/155 Mb (75 ohm) DDM is a metal plate based connecting pannel. It consist of following :-

- (a) Metal fitting assembly including mounting plate for housing Co-Ax connectors and U links.
- (b) COAX connectors/U links of CACT approved connectors of type P5542 and suitable U link.
- (c) Labels for marking the connectors/cables.
- (d) Dust cover for protecting entry of dust/lizard etc.

The size of 140/155 Mb (75W) DDM of 225 x 120mm overall dimation and is directly mountable on Bay frame or slim rack with the help of mounting screws in the holes provided in Bay frame.



2.1.3.3 Layout and Usage

The metal plate of 140/155 Mb DDF module (75 W) have 16 COAX receptacles namely A1-A8 & B1-B8.

When the U link is places across A1-B1, it connects the circuit thru by connecting I/C and O/G cables.

For self loop the U link is connected between A1-A2 or B1-B2.

The incoming and outgoing circuits are connected thru RG50 double screen cable to the connectors by preparing of cable and connectorisation (Ref Fig DT-DDF-005A & 006A).

For monitoring of circuits the U link is removed and incoming and outgoing circuits are tested separately.

2.1.3.4 Cables Used

Following cables are used with this type of modules as under :-

Module Type	Cables Type	Vendors/TAC
1. 140/155 Mb DDF Module (75W)	RG 59 Single Screen cable as per specs.	- Several Udyog, New Delhi - Bhansali Cables, New Delhi TAC shall be provided

2.1.4 Composite 2 Mb/8Mb Module Model No. DDM-120/75A

2.1.4.1 Application

Composite module 2Mb/8Mb is used for terminating, distributing, cross patching of any combination of 2Mb circuits and 8Mb circuits (34Mb/140Mb/155Mb also possible) in single module.

It provides facility of termination of 2Mb circuits thru HF screen cable and 8Mb (34Mb/140Mb/155Mb also possible) circuits thru RG-59 COAX cable.

2.1.4.2 Construction

2/8 Mb composite DDM is a PCB and metal plate based connecting panel. It consist of following :-

- (a) Metal fitting assembly for mounting PCB for 2Mb circuits Mounting plate for housing Co-Ax connectors and U links.
- (b-1) 2.4mm PCB with provision for accepting Jack/U links for isolation and testing and wrapping pin connectors for incoming/outgoing terminations.
- (b-2) COAX connectors mounting plate for mounting connectors/U links of CACT approved connectors of type P5544. (P5542 also possible).
- (c) Labels for marking the connectors/cables.
- (d) Dust cover for protecting entry of dust/lizard etc.

The size of 2/8 Mb composite DDM of 120 x 250 mm overall dimation and is directly mountable on Bay frame or slim rack with the help of mounting screws in the holes provided in Bay frame.

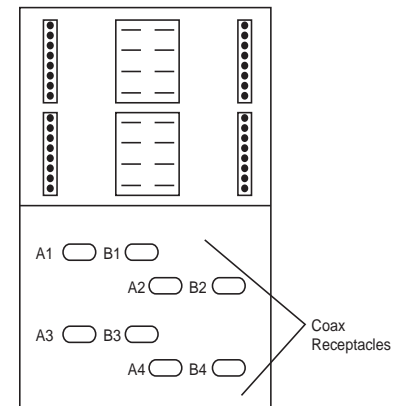
2.1.4.3 Layout and Usages

The 2 Mb/8 Mb composite module (120 W/75W) is a PCB based connecting panel.

The PCB used have 8 pin header or wire wrapping Tag blocks namely TB1-TB4.

The incoming circuits thru 10 pairs/16 pairs HF screen cable of suitable type, are terminated on TB1, TB3. The outgoing circuits are taken thru TB2, TB4.

The metal plate of 2/8 Mb DDF module (75 W) have 8 COAX receptacles namely A1-A4 & B1-B4.



When the U link is placed across A1-B1, it connects the circuit thru by connecting I/C and O/G cables.

For self loop the U link is connected thru RG59 cable to the connectors by preparing of cable and connectorisation (Ref Fig DT-DDF-007A & 008A).

This module provides all circuit testing, isolation and patching facilities which are available in 2 Mb module and 8/34 Mb (and 140/155 Mb) modules.

2.1.4.4 Cables Used

Following cables are used with this type of modules as under :-

Module Type	Cables Type	Vendors/TAC
1. 2 Mb DDF Module (120 W)	10 Pair HF screen cable as per specs.	- Several Udyog, New Delhi - Bhansali Cables, New Delhi TAC shall be provided
2. 8/34 Mb DDF Module (75 W)	RG 59 Single Screen cable as per specs.	- Several Udyog, New Delhi - Bhansali Cables, New Delhi TAC shall be provided

2.1.5 Bay frame or Slim Rack

The Bay Frame are used for mounting the above three types of module.

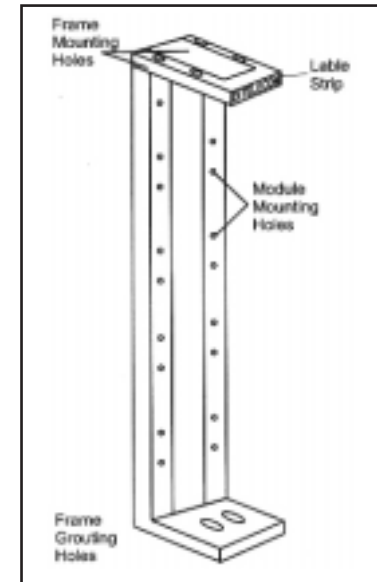
There are two types of Bay Frames of the dimension as stated below.

- (a) 2100m x 120mm x 225m
or
- (b) 2750m x 120m x 225m

The bay frames are the C channel structure having copper strips on both sides for terminating exchange earth. Both copper strips are connected together with a multi conductor cable band.

The modules are mounted on the front of the Bay Frame face for which purpose of M5 mounting holes are provided on the face of the Bay Frame.

Each module is mounted with 8 sets of M5 screws. These screws are driven thru the module into Bay Frame face with the help of long nose star screw driver.



The Frame have a top bracket which supports the name plate. It also holes for fastening the frame to exchange room runway with the help of Nut, Bolt & washers provided with the Bay Frame.

The back of the Bay Frame have 8 Nos of cable tie brackets, one for each module. The exchange cables travel from top of the frame into cable well of the bay Frame and respective cables are tied with the help of cable tie brackets. (Fig DT-DDF-009A & 010A)

The capacity of the bay frame is to mount 8 nos of either type of modules.

2.1.5.1 Earthing Arrangements

There are copper foil strips on both side C channel frame.

These are connected together with copper multistrand cable bands.

There are earth terminating screws painted in red, both at top & bottom of the frame.

The exchange earth is terminated there. The earth tag of the DDF modules also get connected to these earth strips by M3 screws provided.

§ 3. System Specifications

3. Digital Distribution Frame for 2Mbs interface (120 W DDM)

3.1 The Digital Distribution Frame for 2Mbs consists of modules in single bay. The modules shall be of PCB type with wrapping type of terminations. The DDF has the facility for isolating the cable side and equipment side by 4 pin plug/socket arrangement. Through connections are made by 4 pin U link which also provide facility for on line testing. Interconnection/diversion of tributaries are to be done by suitable jumper/patch cords.

Mechanical Specifications

Bay Size	:	Height 200 or 2750 mm width 120 mm
Capacity of 2100 mm	:	Eight modules with inter module Rack gap of 5 mm (app)
Capacity of 2750 mm	:	Eight modules with inter module Rack gap of 60 mm (app)
Module capacity	:	120 ohm module caters to 8 sets of trans & receive terminations of 2 Mb.
Terminations Type	:	Wire wrapping terminations for transmit & receive signals including provision to terminate earth limb of designated cables.
Wire Diameter	:	Cable conductor dia shall be 0.5 mm.
Type of cable	:	Twin screened symmetrical 10 pair 120 ohm TEC approved PCM cable shall be used as per TEC spec. No. G/WIR-04/01 Feb. 93 with amndt. No. 1 dated 26.11.97.
Earth of Bay	:	Earth terminal is provided on either side of the module. These shall be connected to nearest earth terminal on the earth bus-bar on Bay Frame.

Electrical Specifications

Impedance	:	120 W balanced.
Return Loss	:	>25 dB (51 KHz to 3072 KHz) with 3 M cable as specified in type of cable.
Next	:	Between pairs of same tag block (3+3m cable) > 60 dB (51 KHz to 3072 KHz) cable as specified in type of cable.
Insulation	:	Between any two signal pins and any ground and test voltage of 500 V DC for 1 minute >1 M. (Typical >500 M ohm)

Accessories	:	For Slim rack (240).
No. of Patch cords per module	:	8
No. of Patch cords per module if bay is not fully loaded	:	2
No. of U links per module	:	20
Twin screened Symmetrical pair cable	:	Order based as per TEC spec No. G/WIR-04/0 Feb.93 with amndt. No. 1 dated 26.1.97.

3.2 Digital Distribution Frame for 8 Mbs, 34 Mbs, 140 Mbs & 155 Mbs interface (75 W DDM)

3.2.1 The Digital distribution frame for 8 Mbs/34 Mbs/140 Mbs consist of modules in a single bay. The modules are of metal plate type which can mount 75 coaxial connectors. Connectorised cables shall be terminated on PCB/Plate and no solder terminations are to be made. Through connection/isolation shall be made by U link connectors.

Mechanical Specification

Bay Size	:	Height 20 or 2750 mm width 120 mm
Capacity	:	Eight modules with inter module Rack gap of 60 mm (app.)
Module Capacity	:	75 ohm DDM caters to 4 sets of trans & receive terminations.
Terminations Type	:	1.6/5.6 mm coax connector type P5544 for 8/34 Mb and connector type P5542 for 140/155 Mb.
Type of cable	:	RG 59 B/U single screened for 8 Mbs and 34 Mbs & RG 59B/U double screened for 140/155 Mbs. Length site determined. Order based.

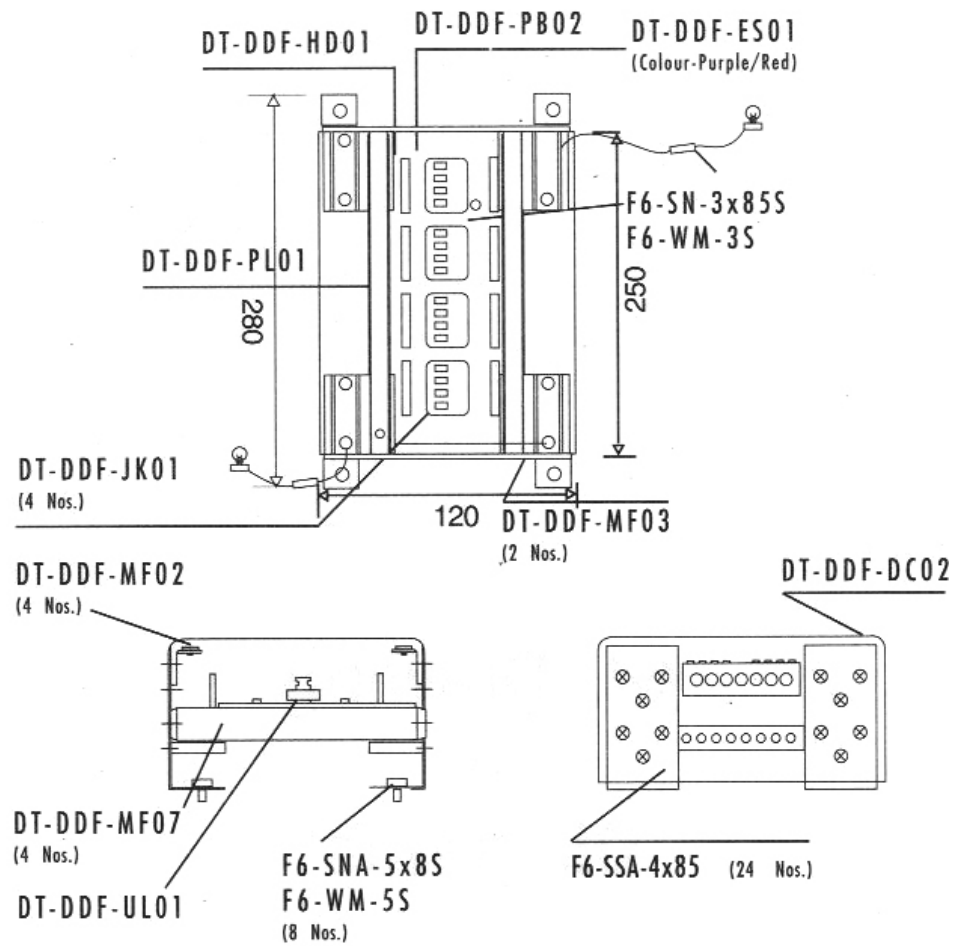
Electrical Specifications

Impedence	:	75 ohm unbalanced
Return Loss	:	> 25 dB (20 KHz to 70 MHz) > 20 dB (70 KHz to 210 MHz) > 20 dB (210 KHz to 240 MHz)

Next	: > 80 dB (20 KHz to 210 MHz) > 80 dB (210 KHz to 240 MHz) with 3M cable between coaxial terminal.
Insulation	: Between any two signal pins and any resistance pin and ground when tested with 500 VDC for 1 minute > 1000M.
Accessories	: For slim rack (240.
No. of Patch cords per module	: 8
No. of Patch cords per module if bay is not fully loaded	: 2
No. of U links per Module	: 20
Coaxial Cable	: RG59 signal screen for 8/34 Mb RG59 double screen for 140/155 Mb as per specs.

§ 4 Drawing & Diagrams

1.	2 MB DDF ASSEMBLY	DT-DDF-002A
2.	2 MB PCB LAYOUT	DT-DDF-003A
3.	8/34/140/155 MB ASSEMBLY DRAWING	DT-DDF-005A
4.	8/34/140/155 MBLAYOUT	DT-DDF-006A
5.	2/8 MB MODULE ASSEMBLY	DT-DDF-007A
6.	2/8 MB MODULE LAYOUT	DT-DDF-008A
7.	BAY FRAME ASSEMBLY	DT-DDF-009A

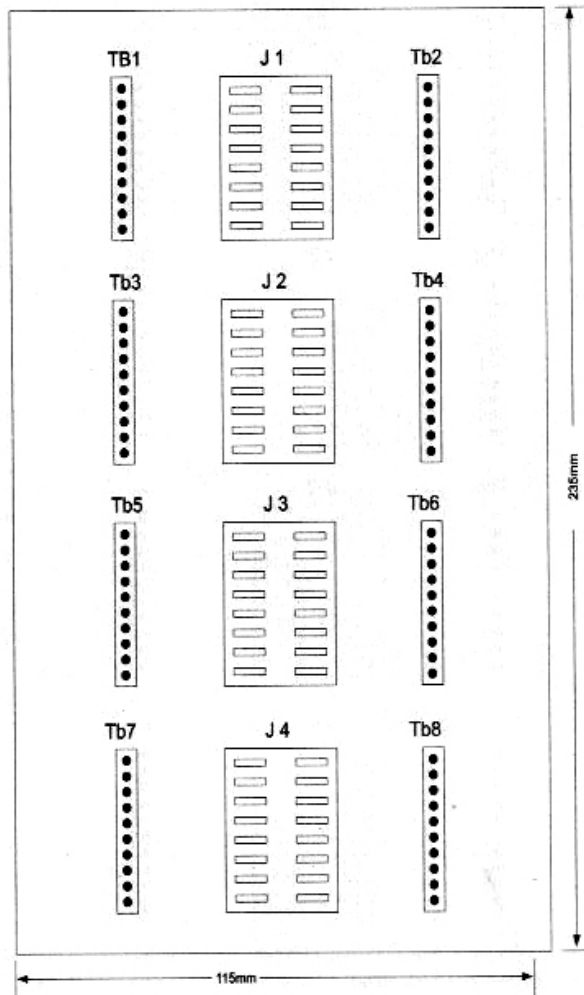


Note :

1. This is an assembly drawing. Tolerance ± 5 mm.
2. All the jacks and headers to be soldered with the P.C.B. before assembly.
3. Jacks to be tightened with nuts and masked before soldering.

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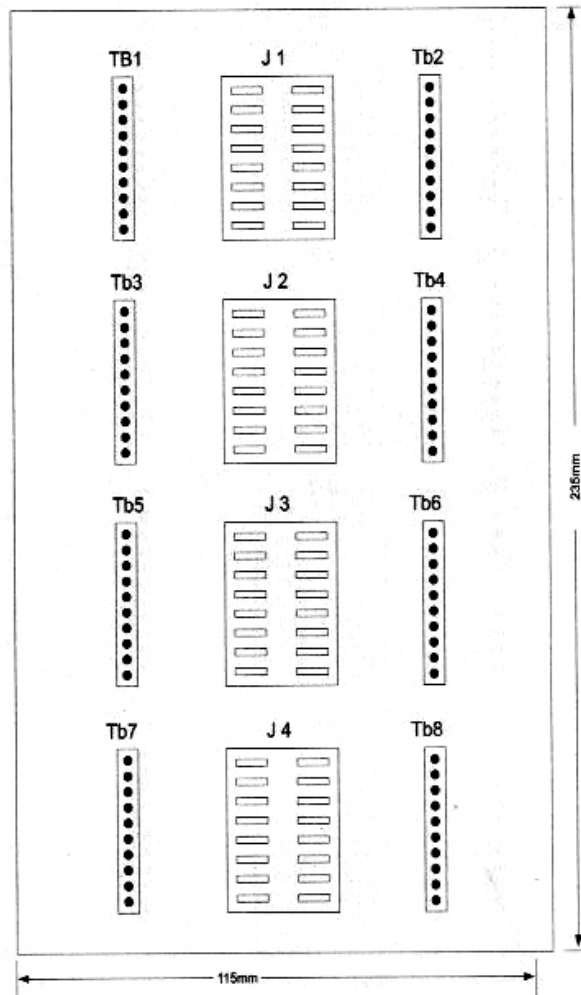
			TITLE	2 Mb DDF Assembly	
			DRAWN		DRAWING NO.
			CHECKED		DT-DDF-002A
			APPROVED		
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TITLE	2 Mb PCB Layout	
DRAWN		DRAWING NO.
CHECKED		DT-DDF-003A
APPROVED		

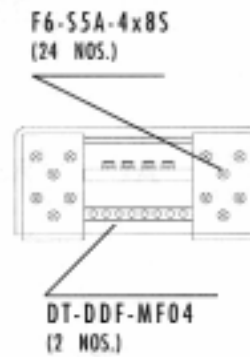
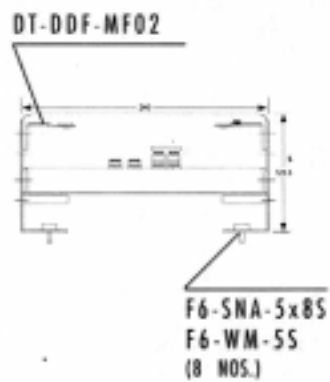
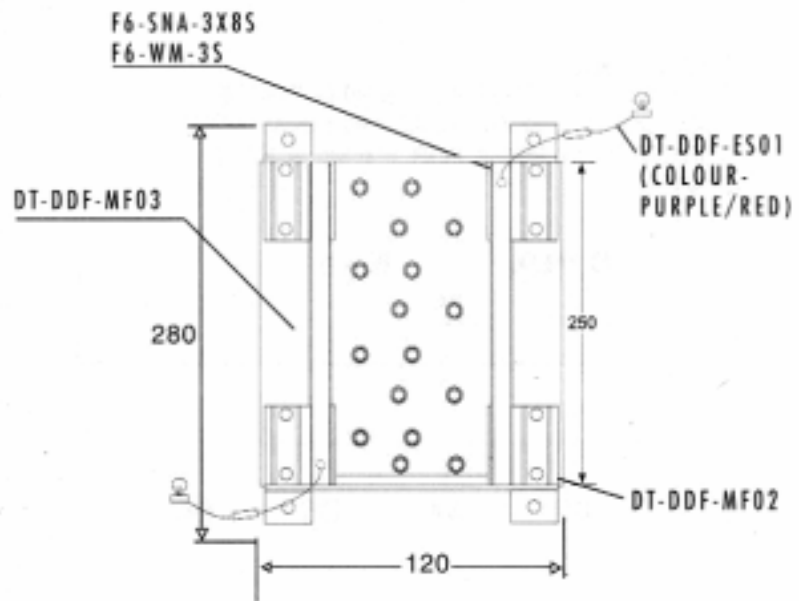
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TITLE	2 Mb PCB Circuit Diagram	
DRAWN		DRAWING NO.
CHECKED		
APPROVED		DT-DDF-004A

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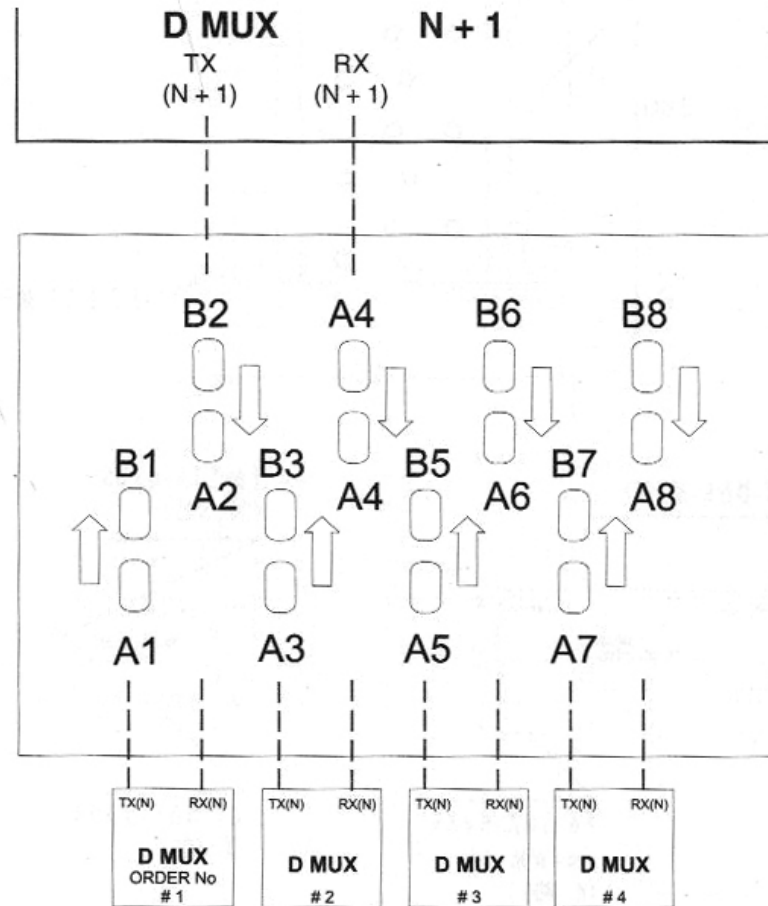


Note :
This is an Assembly Drawing.
Tolarence \pm 5mm.

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TITLE	8/34/140/155Mb DDF Assembly Drawing	
DRAWN		DRAWING NO.
CHECKED		DT-DDF-005A
APPROVED		

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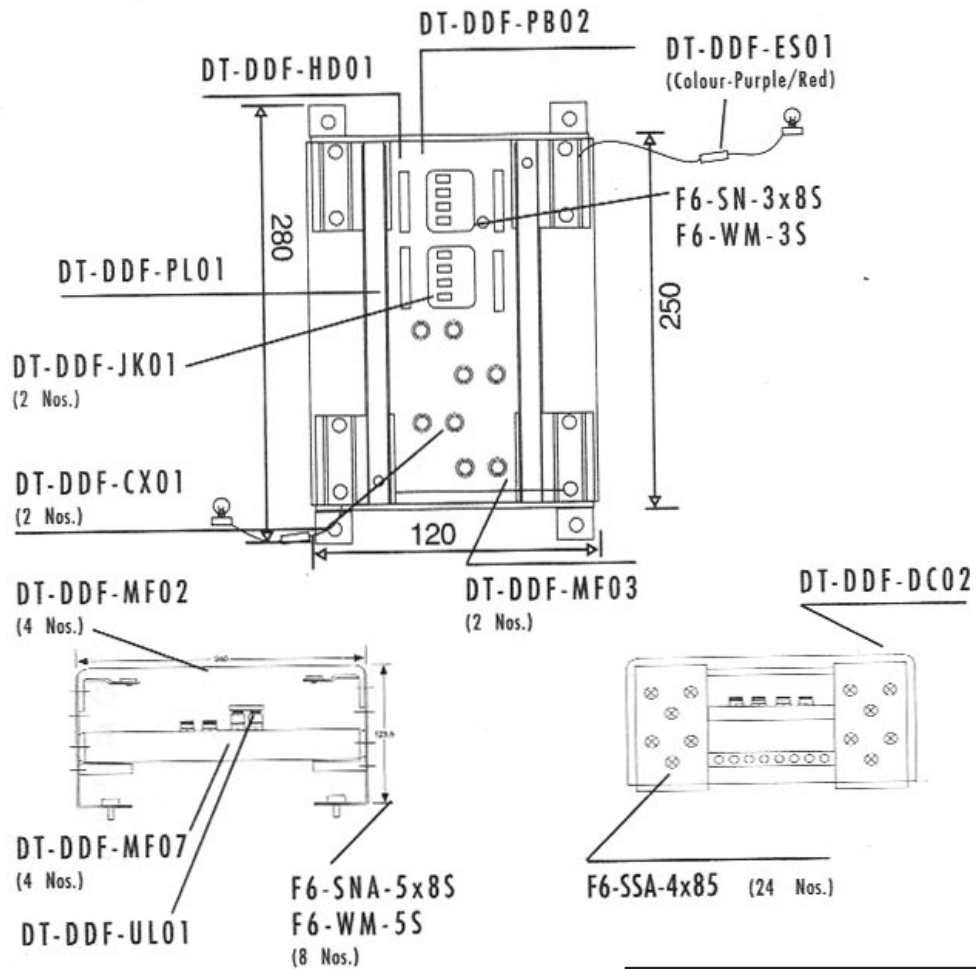
CABLE USED

RG59 SINGLE SCREEN AT 8/34 Mb PORTS
 RG59 DOUBLE SCREEN AT 140/155 Mb
 PORTS CONNECTORS P5544 FOR 8/34 Mb &
 P5542 FOR 140/155 Mb.

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TITLE	8/34/140/155Mb DDF Layout	
DRAWN		DRAWING NO.
CHECKED		DT-DDF-006A
APPROVED		

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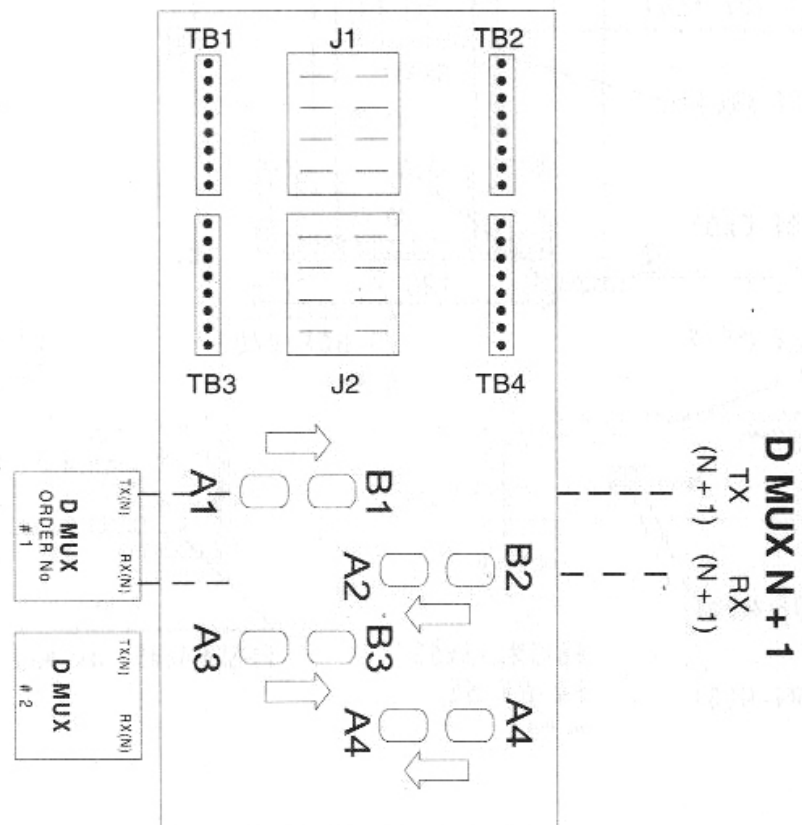


Note :

1. This is an assembly drawing. Tolerance $\pm 3\text{mm}$.
2. All the jacks and headers to be soldered with the P.C.B. before assembly.
3. Jacks to be tightened with nuts and masked before soldering.

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TITLE		2/8 Mb Module Assembly		DRAWING NO.	
DRAWN					
CHECKED					
APPROVED				DT-DDF-007A	
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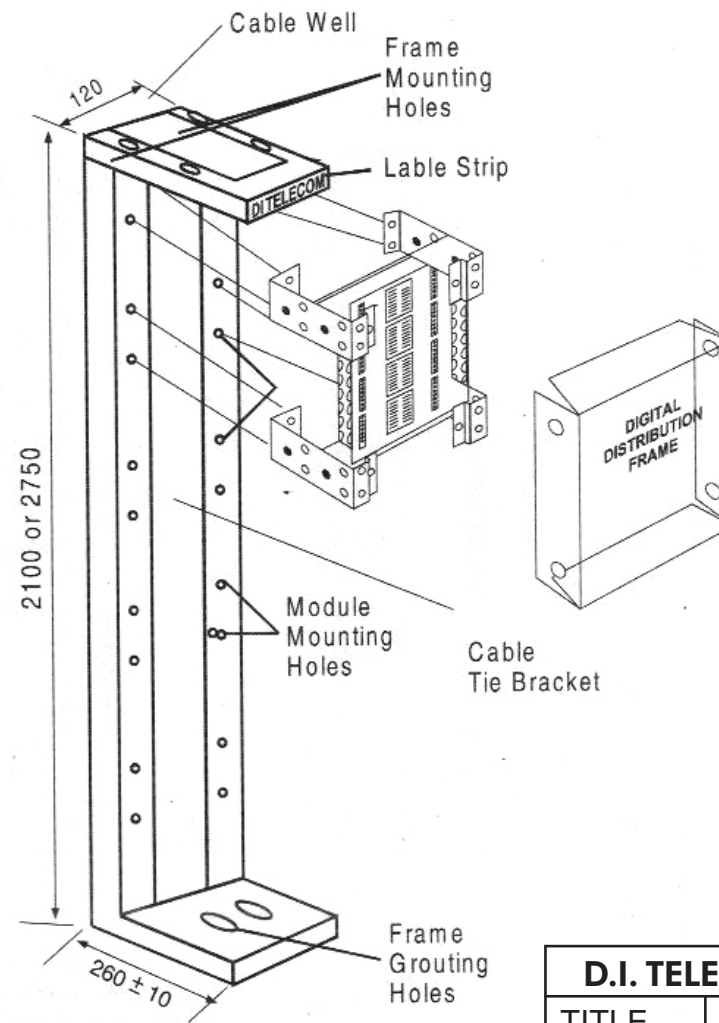
CABLE USED

RG59 SINGLE SCREEN AT 8 Mb (34Mb)
 PORTS RG59 DOUBLE SCREEN AT 140/155
 Mb PORTS PCM SCREEN CABLE AT 2Mb
 PORTS

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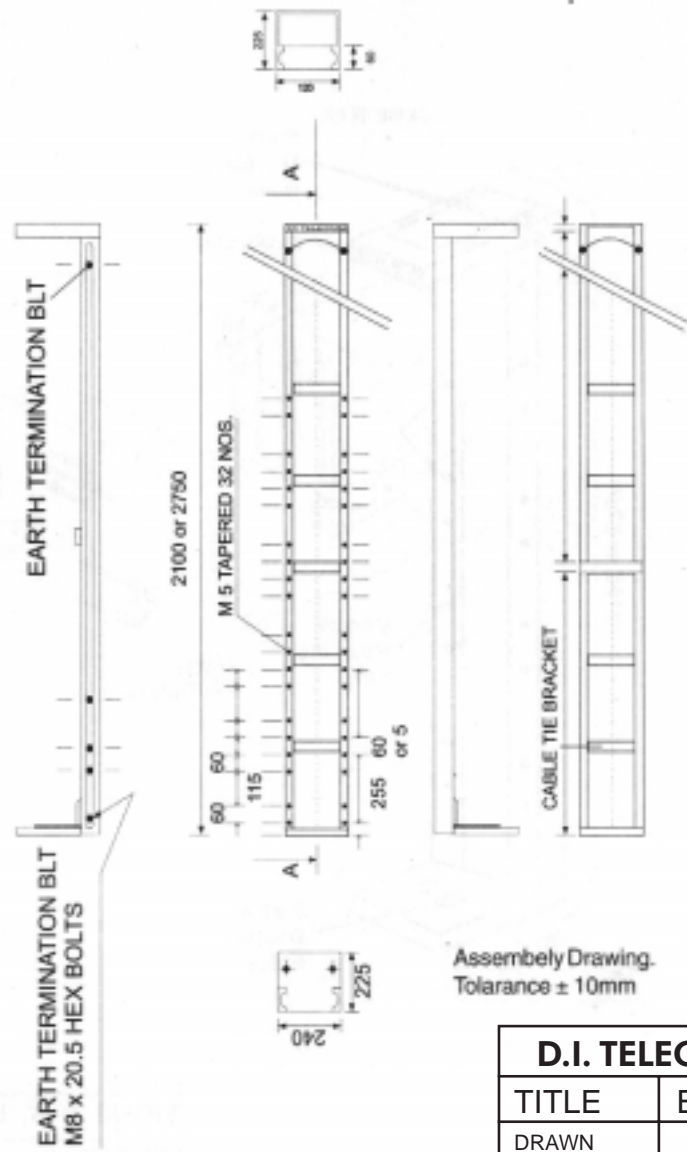
TITLE	2/8 Mb Module Layout	
DRAWN		DRAWING NO.
CHECKED		DT-DDF-008A
APPROVED		

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TITLE		Bay Frame Assembly
DRAWN		DRAWING NO.
CHECKED		
APPROVED		DT-DDF-009A

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TITLE Bay Frame Construction Details

DRAWN _____ DRAWING NO. _____

CHECKED _____

APPROVED _____ **DT-DDF-010A**

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§ 5 Bill of Material

5.1 As described in Chapter 1, there are following type of modules

- | | |
|--|---|
| a. 2 Mb DDF module (120 W)
Model No. DDM - 120A | Used for terminating 2 Mb circuits, Each module have capacity of 8T/8R terminations. i.e. 8 PCM Systems. |
| b.1 8/34 Mb DDF module (75 W)
Model No. DDm - 75 AA | Used for terminating 8 Mb/34Mb circuits, Each module have capacity of 4T/4R terminations. |
| b.2 140/155 Mb DDF module (75 W)
Model No. DDM - 75 BA | Used for terminating 140 Mb/155 Mb circuits, Each module have capacity of 4T/4R terminations. |
| c. Composite 2 Mb/8 Mb module
Model No. DDM - 120/75A | This module is used for terminating any combination of 2 Mb/8 Mb circuits. Each module has a capacity of 4T/4R termination of 2 Mb & 2T/2R termination of 8 Mb. |
| d. Bay frame or Slim Rack
Size 2750 x 120 x 225 or 2100 x 120 x 225 mm
Model No. DDF - 003 | Used for terminating all type of modules as described in A, B, & C. The capacity of each Bay frame is to accept 8 Nos. of either type of modules. |

The bill of material for each type of module is enclosed herewith.

BILL OF MATERIAL FOR 2 Mb DDF MODULE (120 ohm)

S.No.	Description	Part No.	Qty.		Remark/Source/Tec No.
1.	Metal Fitting	DT-DDF - MF01	0	4	Locally Fabricated
2.	Metal Fitting	DT-DDF - MF02	0	4	Do
3.	Lable Holder	DT-DDF - MF03	0	2	Do
4.	Cable Holder	DT-DDF - MF04	0	2	Do
5.	Top Plate	DT-DDF - MF07	0	1	Do
6.	PCB	DT-DDF - PB02	0	1	Hi-Rel Pune
7.	16 Pin Jack	DT-DDF - JK01	0	4	Gilard/HE
8.	4 Pin Jack	DT-DDF - UL01	1	6	Gilard/HE
9.	PCB Header	DT-DDF - HD01	0	8	Gilard/HE
10.	Dust cover	DT-DDF - DC02	0	1	Local
11.	Polyster Sheet	DT-DDF - PS01	0	2	Do
12.	Paper Lable	DT-DDF - PL01	0	2	Do
13.	Earth Strap	DT-DDF - ES01	0	2	Own Fabricated
14.	Screw	F6-SNA-3x85	0	9	Raj nath Fastners
15.	Screw	F6-SSA-4x85	2	4	Raj nath Fastners
16.	Screw	F6-SNA-5x85	0	8	Raj nath Fastners
17.	Washer	F6-WM-35	0	9	Raj nath Fastners
18.	Washer	F6-WM-55	0	8	Raj nath Fastners
19.	Wrapping Wire	DT-DDF-WW01	0	1	Servel Udyog
20.	Test Cord	DT-DDF-TC01	0	1	HE/cal comp.
Date	Prepared By: Shashwati		Title-120 W DDF Block		
			Part List		
Issue	Checked By :		Drg. No. : DT-DDF-AS02A		
Sheet 1/1	Approved By :		DITL, Gurgaon		

BILL OF MATERIAL FOR 8/34 Mb DDF MODULE (75 ohm)

S.No.	Description	Part No.	Qty.		Remark/Source/Tec No.
1.	Metal Fitting	DT-DDF - MF01	0	4	Locally Fabricated
2.	Metal Fitting	DT-DDF - MF02	0	4	Do
3.	Lable Holder	DT-DDF - MF03	0	2	Do
4.	Cable Holder	DT-DDF - MF04	0	2	Do
5.	Top Plate	DT-DDF - MF07	0	1	Do
6.	-	-	-	-	-
7.	Coax Connector	DT-DDF - CX01	1	6	Protection / HET
8.	U-Link - 75 ohm	DT-DDF - UL01	0	8	Protection / HET
9.	-	-	-	-	-
10.	Cover	DT-DDF - DC02	0	1	Local
11.	Polyster Sheet	DT-DDF - PS01	0	2	Open Market
12.	Paper Lable	DT-DDF - PL01	0	2	Open Market
13.	Earth Strap	DT-DDF - ES01	0	2	Own Fabricated
14.	Screw	F6-SNA-3x85	0	2	Raj nath Fastners
15.	Screw	F6-SSA-4x85	2	4	Raj nath Fastners
16.	Screw	F6-SNA-5x85	0	8	Raj nath Fastners
17.	Washer	F6-WM-35	0	2	Raj nath Fastners
18.	Washer	F6-WM-55	0	8	Raj nath Fastners
Date	Prepared By: Shashwati		Title-120 W DDF Block		
			Part List		
Issue	Checked By :		Drg. No. : DT-DDF-AS02A		
Sheet 1/1	Approved By :		DITL, Gurgaon		

BILL OF MATERIAL FOR 140/155 Mb DDF MODULE (75 W)

S.No.	Description	Part No.	Qty.		Remark/Source/Tec No.
1.	Metal Fitting	DT-DDF - MF01	0	4	Locally Fabricated
2.	Metal Fitting	DT-DDF - MF02	0	4	Do
3.	Lable Holder	DT-DDF - MF03	0	2	Do
4.	Cable Holder	DT-DDF - MF04	0	2	Do
5.	Top Plate	DT-DDF - MF08	0	1	Do
6.	-	-	-	-	-
7.	Coax Connector	DT-DDF - CX01	1	6	Protection / HET
8.	U-Link - 75 ohm	DT-DDF - UL01	0	8	Protection / HET
9.	-	-	-	-	-
10.	Cover	DT-DDF - DC02	0	1	Local
11.	Polyster Sheet	DT-DDF - PS01	0	2	Open Market
12.	Paper Lable	DT-DDF - PL01	0	2	Open Market
13.	Earth Strap	DT-DDF - ES01	0	2	Own Fabricated
14.	Screw	F6-SNA-3x85	0	2	Raj nath Fastners
15.	Screw	F6-SSA-4x85	2	4	Raj nath Fastners
16.	Screw	F6-SNA-5x85	0	8	Raj nath Fastners
17.	Washer	F6-WM-35	0	2	Raj nath Fastners
18.	Washer	F6-WM-55	0	8	Raj nath Fastners
Date	Prepared By: Shashwati		Title-120 W DDF Block		
			Part List		
Issue	Checked By :		Drg. No. : DT-DDF-AS02A		
Sheet 1/1	Approved By :		DITL, Gurgaon		

BILL OF MATERIAL COMPOSITE 2/8 Mb DDF MODULE

S.No.	Description	Part No.	Qty.		Remark/Source/Tec No.
1.	Metal Fitting	DT-DDF - MF01	0	4	Locally Fabricated
2.	Metal Fitting	DT-DDF - MF02	0	4	Do
3.	Lable Holder	DT-DDF - MF03	0	2	Do
4.	Cable Holder	DT-DDF - MF04	0	2	Do
5.	Top Plate	DT-DDF - MF08	0	1	Do
6.	PCB 2.4mm	DT-DDF - PB03	0	1	HI Rel Pune
7.	Coax Connector	DT-DDF - CX01	0	4	Protection / HET
8.	U-Link - 75 ohm	DT-DDF - UL01	0	2	Protection / HET
9.	PCB Header	DT-DDF - HD01	0	4	Gilard/ HE
10.	Cover	DT-DDF - DC02	0	1	Local
11.	Polyster Sheet	DT-DDF - PS01	0	2	Open Market
12.	Paper Lable	DT-DDF - PL01	0	2	Open Market
13.	Earth Strap	DT-DDF - ES01	0	2	Own Fabricated
14.	Screw	F6-SNA - 3x85	0	2	Raj nath Fastners
15.	Screw	F6-SSA - 4x85	2	4	Raj nath Fastners
16.	Screw	F6-SNA - 5x85	0	8	Raj nath Fastners
17.	Washer	F6-WM -3 5	0	2	Raj nath Fastners
18.	Washer	F6-WM - 55	0	8	Raj nath Fastners
19.	16 Pin Jack	DT-DDF - JK01	0	2	Gilard/ HE
20.	4 Pin U Link	DT-DDF - UL01	0	8	Gilard/ HE
Date	Prepared By: Shashwati		Title-120 W DDF Block		
			Part List		
Issue	Checked By :		Drg. No. : DT-DDF-AS02A		
Sheet 1/1	Approved By :		DITL, Gurgaon		

§ 6 Packaging, Installation & Wiring

6 Bay frame

The DDF equipment is supplied in corrugated cartons of suitable thickness for Road Worthiness.

6.1 After the receipt of equipment the long package containing the frame is to be opened first carefully using standard tools. The bay has to be lifted from the packing case alongwith the cushioning pad and shifted to the place of installation.

Unpacking and shifting to be done under proper supervision. Atleast two personnel ae required for the work.

6.1.2 The DDF is erected on place of installation for marking position of grouting holes of 19mm (dia) x 60 mm depth. Holes are drilled and two expansion bolts 10 mm (dia) x 70 mm length are pushed inside and frilled with sealent. DDF bay is held by these screws on base plate at the base of the frame.

Also for anchoring at the top of the bay frame to the exchange angles, two holes are provided on the top bracket at site. Two holes of 12 mm (dia) are to be drilled on the exchange angles and bay top is secured tight using the M 10 bolts and nuts.

6.2 Modules

6.2.1 Module shelves come in two shapes 120 ohm DDm & 75 ohm DDM with holes on from channel and relevent termination arrangement. These are shelf assemblies, packed in thermocole boaes with cushioning all around and packed securely. For unpacking, the tape pasted around the thermocole box is to be broken with a sharp knife and the module is to be drawn out of the box carefully and transfered to bay site for mounting.

Alternatively the modules are mounted on rack and shipped as ready to install equipment.

6.2.2 After installing the bay frame the DDM's are mounted using the 8 no M5 screws provided at regular intervals in appropriate locations on the bay frame. Key holes are provided on top of the module. Acess to the frame to reach the screw is obtained through holes provided on top of the module after removing cover. (When frame and modules are shipped loose)

6.2.3 Module can be mounted and removed from the bay as explained in Fig. DT-DDF-011A & 012A.

6.3 Cabling and Wiring

6.3.1 Access for cabling and wiring is at the front side from top bottom of each module.

6.3.2 Cabling

6.3.2 Cable to be terminated on the DDM's shall be laid and brought in two bunches through the cable well of the DDF to appropriate location with sufficient length providing the slack for movement of DDM's. Cables are anchored at regular intervals to cable tie brackers provided at the back of the Bay Frame.

Front cover is provided to stop entrt of dust, lizard etc., panel can be removed by unscrewing the four screws at the corners of the panel.

6.4 Wiring

6.4.1 DD Module 2 Mb (120 W) symmetrical pair.

The Digital Distribution module for terminating 2Mb it signals have characterstic impedienc of 120 W. The fig. DT-DDF-002 & 003 explains various parts pf the module as under :-

TB-1 to TB-4 are wrapping post with 3.96mm pitch connectors and provides 48 points for wrapping incoming wires. The capacity of the module is to accept 8 PCM systems of 2 Mb it each. The The corresponding output terminals are TB 2, 4, 6, & TB 8.

J1-J4 are 16 PIN Jack & provided for testing. The link is made through with suitable U links.

6.4.2 The signal interconnected in this module use 10 pair symmetrical 120 W cable indicated in chapter "2". The installation wiring for this module is done by wire-wrapping with sufficient slackness in cable to tip and ring terminals (A&B). Earth loop connection is extended from PC earth terminal to Frame earth bus bar. Cable to be secured to the module at top and bottom with cable tie strip (Ref. Fig. DT0DDF-010A), passing through slots (Fig. DT0DDF-01A). Bottom to top signals (Tx) and top to bottom signals (Rx) are seperate in two vertical halves of a module. Standard through connections are wire wrapped as pre-wired connections in the works. Cross connection required to effect diversion of route can be done at site when needed (Ref. Fig. DT-DDF-005A).

6.5 DD Module Higher Order (75 W Coaxials)

The Digital Distribution module for terminating higher order bit stream is having 75 ohm characterstic impedienc and uses suitable COAXIAL connectors. For 8mb and 34/140/155 Mb. The through link is made by putting spinner type

U link. The Fig D-DDF-005A & 006A above shows the various components of 75 W DDF module. The 75 W DDF module provides for terminating four sets of trans & receive terminals. There are two types of Co-ax connectors used on these blocks i.e. P5544 for terminating 8/34 Mbit signal & P5542 for terminating 140/155 Mb signals.

6.5.1 The signals interconnected in this module use 75 coaxial cables. The type of cables to be used is indicated at chapter 6. (The coaxial jacks are mounted on modules).

6.5.2. Each cable are to terminated on to coaxial connector with sufficient slackness in the cable for relocation/removing the signals. The terminated jacks are inserted and secured by cable tie strips in to the front panel holes from the rear (Fig. DT-DDF-005A & 006A).

Right row - A1 A2 A3 A4 A5 A6 A7 A8
Left row - B1 B2 B3 B4 B5 B6 B7 B8 (Refer in Fig. DT-DDF-005A & 006A)

Standard through connection is achieved by inserting 75 ohm shorting links as a approved by TEC of Type P5611, into appropriate send & rec coaxial sockets :-

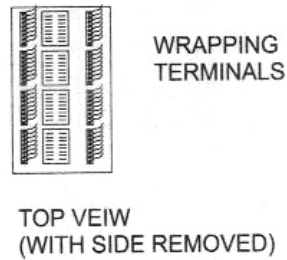
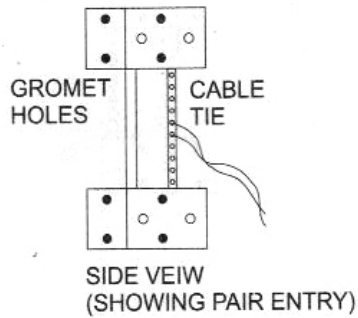
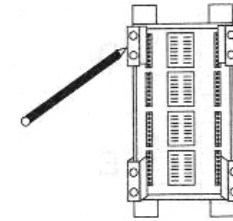
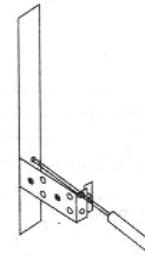
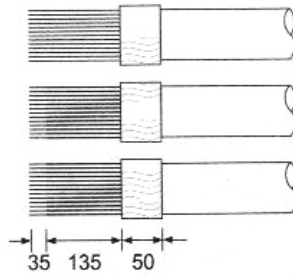
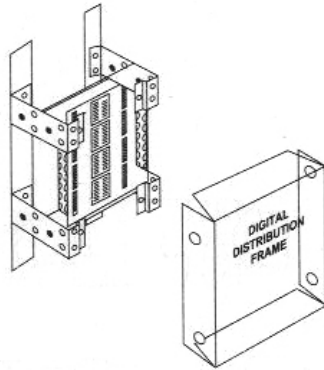
- (a) A1-A2 self loop on lower order side.
- (b) B1-B2 self loop on higher order side.
- (c) A1-B1 through connection inn Tx direction.
- (d) B2-A2 through connection inn Rx direction.

6.6 Earthing

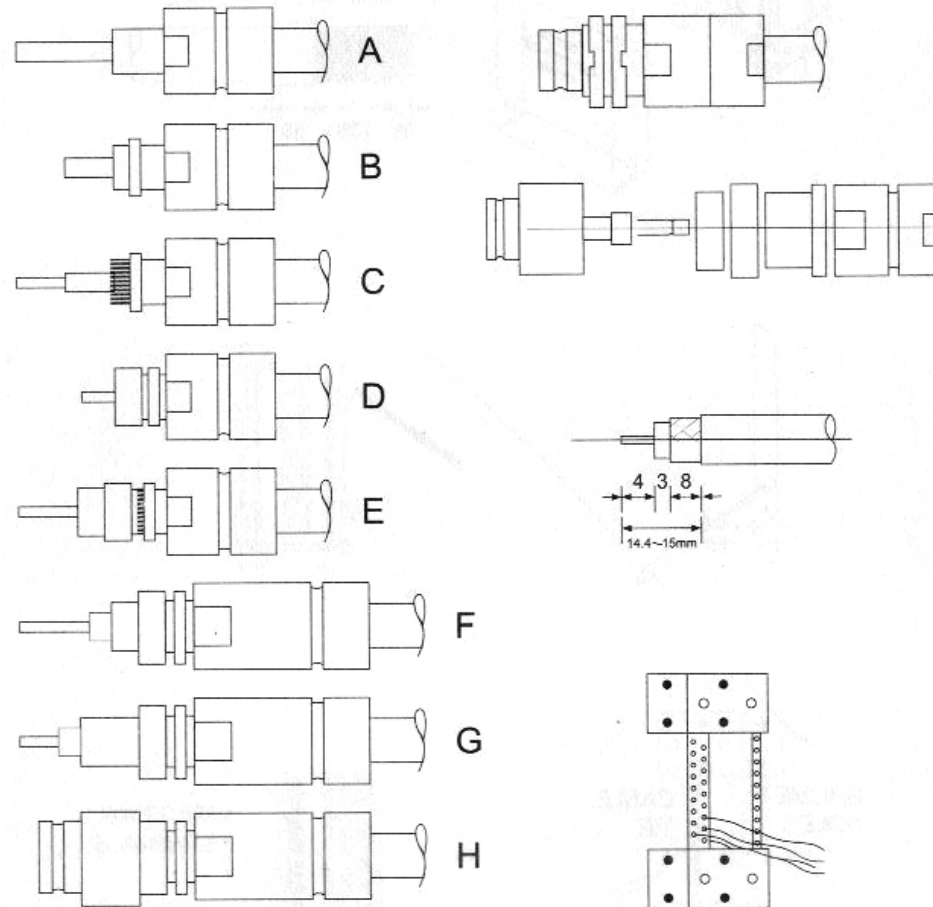
Exchange earthing wire are to be connected to the earth terminal at the bottom of earth bus bar on either side of the frame. Earth terminals are provided on the modules to get connected to the nearest earth terminal on bus bar of the bay.

6.7 Labels

After exchange wiring has been completed and checked, appropriate route/signal address lables are designated on lables in a lable holder on direction of signal flow. These lable holder ae provided with blank lables on each module.



D.I. TELECOMMUNICATIONS PVT. LTD.		
TITLE	Method of Installation (2Mb Module)	
DRAWN		DRAWING NO.
CHECKED		
APPROVED		DT-DDF-011A
REVISION	1	2
	3	



D.I. TELECOMMUNICATIONS PVT. LTD.

TITLE Method of Installation (Coax Module)

DRAWN _____ DRAWING NO.

CHECKED _____

APPROVED _____ **DT-DDF-012A**

REVISION

1	2	3
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§ 7. Operation & maintenance

7.1 Operating Facilities

After Digital Distribution Fram has been installed and exchange wiring to it had been completed & checked, the following operational facilities are available.

7.2 2 Mb, 120 Symmetrical Pair

Standard Mode : This module has been pre-wired for through connections. Break in through path is possible by removing the corresponding 4 Pin U Links.

Temporary patching is done by using a pair of balanced cord and plug assembly at the 16 pin socket level by removing the break point on U-Link, Tx, Rx paths.

Permanant patching is done by changing straight connection to crossed wire wrapping on appropriate Tx/Rx signals pairs in the wire-wrap patch field.

Inter bay patching is done by appropriate routing of the patch cords, 1.5m in length to appropriate points on neighbouring DDF.

For monitoring, two cord and plug assemblies accompany each bay (which is order based). This can be hooked up to the monitoring points on the U-Link plugged into the break point on a signal path to study / measure signal characteristics without disturbing/breaking the signal flow.

LOOP BACK : For maintenance and service check up Tx-Rx loop back can be provided on a channel by plugging balanced patch cord to appropriate position on the 16 pin socket, removing the corresponding U-Link.

7.3 8/34/140 Mb 75 ohm Co-axial cable

Standard Mode : This module has all cabled coaxial sockets mounted in appropriate send/receive locations caters for 4 sub-systems. Insertion of coaxial between A1, A8, B1, B8 provide through path. Break in through is done by the removal of coaxial U-Links.

Temporary patching is done by using a pair to coaxial cord & plug assy to patch Tx/Rx signals on coaxial sockets in Tx, Rx paths in the module removing the corresponding U-Link.

Permanent patching : When signal routing has to be permanently diverted it is possible to remove the coaxial cable with socket termination and remount on the DD panel with sufficient slack in the coaxial cable so what the Tx, Rx sockets are aligned and standard 30mm coaxial U-Link is inserted for providing through path.

Inter Bay Frame Patching is done by appropriately routing the patch cables 2m in length, to neighbouring DDF.

LOOP BACK : Loop back of send & receive signals is done by inserting the coaxial U-Link horizontally across Tx-Rx ports [An-(An+1) or (Bn+)] of the channel.

Loop Back Chin : Connections for send and receive signal of the four tributaries of Higher Order Mux terminated on the modules is done by inserting coaxial link between B2-B3, B4-B5, B6-B7 respectively send signals feed at B1 and receive taken out at B8.

For monitoring the digital stream without distributing the signal flow coaxial monitoring port is provided on U-Link where the measurement cord and plug assy can be hooked up to connect to instrument.

7.4 Maintenance Instruction

7.4.1 Periodical Maintenance

The equipment can be kept clean and in satisfactory working condition by periodical checks.

7.4.2 Preventive Maintenance

Preventive maintenance is the systematic care, servicing and inspection of the equipment to prevent the occurrence of trouble, to reduce downtime and to ensure that the equipment is serviceable.

7.4.3 Systematic care

The procedure given in the following paragraphs cover systematic care essential for proper up keeping and operation of the equipment. The cleaning operation should be carried out daily, the cleaning operation must be done before operating the equipment, or after any shutdown, or once a week, while the equipment, is kept in standby condition.

7.4.4 Preventive Maintenance checks and services

The preventive maintenance checks (*) and services outline functions to be performed at specific intervals. These checks and services are to maintain equipment in good general condition and in good operating condition, if the defect can not be remedied by the operator by these checks, higher category maintenance or repair is required.

7.4.5 Operators Daily Preventive Maintenance Checks

Sl. No.	Item to be Procedure Inspected
1. Completeness	Check that equipment is complete.
2. Ext. Surfaces	Remove dust, dirt and moisture from the equipment surface.
3. Controls/Plugs	Check all the control/Plugs for looseness and other damages.

7.5 Cleaning

- (a) Remove dust and other loose dirt with a blower and brush.
- (b) Remove grease, fungus and ground-in-dirt from the case; use a cloth ampenend (not wet) with cleaning compound (Isopropyl Alcohol).
- (c) Remve dust and and other dirt from plugs and receptacles using blower & brush.
- (d) Clean the panel with a soft brush. If dust is difficult to remove, dampen the brush on isopropyle Alcohol.

Note : Preventive maintenance checks may include local loop back/tandem loop test using patch and measurement cord and plug assemblies provided with each bay/module at the 16 pin break point socket level either breaking or not breaking the link.

§ 8. Recommended Cables & Spares

8.1 Recommended Cables

CABLE TYPE	USED FOR
10 Pair shielded cable..... (Symmetrical 120 E)	2Mbps
RG 59 B/U (Signal Screen).....	8 Mbs/34 Mbs
RG 59 B/U (Double Screen).....	140/155 Mbs
Coaxial Cable 75ohm	

8.2 Recommended panel mounted connectors to suit the 75 ohm coaxial cable for the required bit rates indicated in Table 2.

CABLE TYPE	BIT RATE
CONNECTOR TYPE	
RG 179 B/U (Singal Screen).....	8.34 Mb
P5544	
Coaxial Cable 75E	
RG 59 B/U (Double Screen).....	140/155Mb
P5542	
Coaxial Cable 75ohm or equivalent.	

8.3 General Installation Information

The Module and frames are simple in construction and handling for site requirements. The following installation material/Tool are needed at site for mounting, assembling and installation / wiring.

Sl. No.	Description	Qty.	Remark
1.	Frame	Order Based	Supplied
2.	120 W Patch Cords with cords and two Plugs	-	Order based 1.5mm
3.	4 Pin plug for 120 W	16	Order based
4.	75 W U-Link	8 Nos	Supplied
5.	Grounding Bolts & Nuts	1 Set	Provided with Frame
6.	Ground Cable	-	Order based
7.	M4 Screw	1 set	Supplied
8.	Spanner Sets	-	To be arrange by installer
9.	Phillips head screw driver	-	-do-
10.	VF station cable	-	Order based
11.	Co-Ax Cable	-	- Order based
12.	Jumper Wire	-	Cross jumper field prewired
13.	PVC adhesive tape 1 set	-	Order based
14.	Cable ties etc.	1 set	Supplied
15.	Wrapping gun/bit etc.	-	Order based.