

## Comparison Matrix - 1

	Fibrejack	F07/PN	Direct	VF-45	LC	Mini-MT
Mechanical Spec reference	TIA FOCIS-6	IEC 1754-16	TR -41 pending	PN-3968, FO-6.3, FOCIS 7	IEC 86B WG6	IEC NWIP accepted
Patent letter filed with IEEE	Yes	? / ?	Yes	In process, ANSI	In process	No, but willing TIA
System cost compared to UTP-5	1.5 x - 1.8 x	comparable / ?	1.5x	1.48X	1.2X to 1.5X	2-3X
Environmental endurance (as per FOTP)	Proven	not tested / ?	Yes	Yes	Yes	TBD
Installation cable termination complexity (describe)	as demonstrated	as demonstrated	as demonstrated	as demonstrated	as demonstrated	as demonstrated
Maintenance required (describe)	none	None	none	None	None	None
Maintenance advised before connection (describe)	Clean by wiping off ferrules	Wipe endface / cleaning (fiber end alignment hole)	use alcohol	Use HFE solution with spray	Clean before connection.	clean
Protection from dust etc (describe)	Dust caps, integrated shuttered doors in outlets, etc.	Dust covers included in conn. kit / cap	dust covers	Spring loaded door for VF-45 socket and slide door for VF-45 plug.	protective cap on the connector and adapter.	Standard covers

Note: All costs are compared to approximate equivalent for UTP/RJ-45, as independently determined by the individual proposers

## Comparison Matrix - 2

	Fibrejack	F07/PN	Direct	VF-45	LC	Mini-MT
Duplex, asymmetric, differentiated (keying etc)	Yes Key could be added	Yes / Yes Key could be added	Yes Key could be added	yes, with RJ-45 latch. Key could be added	Yes Has key	Yes Key could be added
Support speeds from 125 MBaud up to 4GBaud	Yes	No (TBD from device mfrs) / TBD	Yes	Yes	Yes	Yes
Suitable for equipment, dongles and wall plates	Yes, fully modular with RJ-45	Yes / Yes	Yes	Yes	Yes	Yes
Size compared with RJ45 aperture	same	2X	same	same	Smaller	Smaller
Worst-case loss (dB) perconnection	0.75 dB (average: 0.16 dB)	2.0 dB / 2.0 dB	POF 2.0dB GOF deign target 0.75 dB	Less than 0.75dB. Typical 0.5dB,	0.4dB (average 0.10 dB)	0.75dB
Performance complies to TIA 568 requirements	Yes	? / ?	POF YES GOF TBD (Design goal)	YES, also IEC.	YES, also IEC and Bellcore	Yes
Suitable for MMF (50 micrometre core, 125 micrometre OD)	Yes	Yes- 200/230um HCS / Yes (TBD)	Yes- 50/125 or 62.5/125	YES, 50 and 62.5 micron.	Yes	Yes
Suitable for POF	Yes	Yes- 1000um plastic / Yes	Yes - SI POF or GRIN POF	no	with design work (started)	No
Physical safety issues during installation	exposed fibres during installation	exposed fibres during installation	exposed fibres during installation	Bare fiber handling is minimized during installation	exposed fibres during installation	exposed fibres during installation
Physical safety issues in normal operation	Fibre protected by ferrules	No / ?	No exposed fibres in normal use	Fibres protected by plastic and shroud	Fibre protected by ferules. Also comply with UL-94 & Bellcore GR326	Fibre protected by ferrules

## Comparison Matrix - 3

	Fibrejack	F07/PN	Direct	VF-45	LC	Mini-MT
What is available for GOF	connectors, tools and outlet/enclosures	Conns for 200/230um HCS style fibers /		connectors, adapters, tool kits, enclosures, test	Connectors, adapter, patch cords, enclosures, tool kits	
What is available for POF	N/A	Conns for 1000um POF etc	S200 Jack and plug	N/A	None.	N/A
What is under development for GOF	Quick termination techniques, low cost molded components	/ nothing	Jack and Plug - MAR '98	Amateur tool kit.	Attenuators etc	
What is under development for POF	Full line circa Q1 98	/ TRX(S200)	S400 Mar '98 S800/3200 TBD	N/A	Preliminary work on POF connector	N/A
performance after 500 cycles	<.3 dB change	2.5dB max / TBD	TBD design goal < .3dB	< 0.3dB change	<0.2dB change	
performance after 1500 cycles	TBD	not rated / questionable	TBD design goal < .3dB	< 0.3dB change (1000 cycles)	1000 cycles < 0.2dB change	
independent testing (including round robin) info	Dozens of end user sites world-wide	Tested internally t/ not yet	PENDING	Beta's in USA, Europe and Japan.	several installed sites	
number of vendors of the proposed connector	Multiple licensees	At least 3 companies / more than 3	3 OTHERS PENDING	3M, several Licensees in process	1 today, potential of 4 by year end	5
transceiver integration information	100BASE-FX, 155 Mbps ATM available, Gigabit in development	S100 available, S200 developing	S200 NOW, S400 MAR '98, S800/3200 TBD	10Mbps, 4/16mbps, 100Mbps & Gigabit sampling	Several companies considering manufacturing transceiver. 155, gigabit in development	Yes

## *Fibrejack Comparison Matrix - 1*

	Fibrejack
Mechanical Spec reference	TIA FOCIS-6, IEC New Work Item Proposal, Proposed for TIA-568-A
Patent letter filed with IEEE	Submitted
System cost compared to UTP-5	1.5 x - 1.8 x
Environmental endurance (as per FOTP)	2.5 mm ferrules have 20 years proven success and reliability in market. Yes, Fiber Jack is warranted
Installation cable termination complexity (describe)	As demonstrated
Maintenance required (describe)	none
Maintenance advised before connection (describe)	Clean by wiping off ferrules
Protection from dust etc (describe)	Dust caps, integrated shuttered doors in outlets, etc.

Note: All costs are compared to approximate equivalent for UTP/RJ-45, as independently determined by the individual proposers

## *Fibrejack Comparison Matrix - 2*

	Fibrejack
Duplex, asymmetric, differentiated (keying etc)	Yes, polarization assured Key could be added
Support speeds from 125 MBaud up to 4GBaud	Yes
Suitable for equipment, dongles and wall plates	Yes, fully modular with RJ-45
Size compared with RJ45 aperture	Yes, exact
Worst-case loss (dB) per connection	Worst case per TIA-568 (0.75 dB); Actual average: 0.16 dB Single-mode average: 0.19 dB
Performance complies to TIA 568 requirements	Yes, also provides pull proof non-optical disconnect functionality. Works with all standard, widely available fiber and fiber cable products.
Suitable for MMF(50 micrometre core, 125 micrometre OD)	Yes, works also with single-mode fiber
Suitable for POF	Yes
Physical safety issues during installation	Exposed fibres during installation
Physical safety issues in normal operation	No, fibre protected by ferrules

## **Fibrejack Comparison Matrix - 3**

	Fibrejack
What is available for GOF	10 months world-wide sales including connectors, tools and outlet/enclosures
What is available for POF	N/A
What is under development for GOF	Quick termination techniques, low cost molded components
What is under development for POF	Full line available by Q1 98
performance after 500 cycles	No change (<.3 dB per TIA)
performance after 1500 cycles	Not required by TIA, testing underway
independent testing (including round robin) info	Dozens of end user sites world-wide
number of vendors of the proposed connector	Multiple licensees
transceiver integration information	100BASE-FX and up to 155 Mbps (ATM) available, Gigabit speed transceivers under development

## *F07/PN Comparison Matrix - 1*

	F07/PN
Mechanical Spec reference	JIS C-5976 / IEC 1754-16
Patent letter filed with IEEE	? / ?
System cost compared to UTP-5	comparable / ?
Environmental endurance (as per FOTP)	not tested to 20 year life / ?
Installation cable termination complexity (describe)	As demonstrated
Maintenance required (describe)	None
Maintenance advised before connection (describe)	Wipe endface with lint free cloth / cleaning (fiber end alignment hole)
Protection from dust etc (describe)	Dust covers included in conn. kit / cap

Note: All costs are compared to approximate equivalent for UTP/RJ-45, as independently determined by the individual proposers

Note: AMP has some of the cost information requested. However, discussion of specific cost information must be deferred to the AMP Legal Department, namely Jim Gibson (717-592-4769, email [jmgibson@amp.com](mailto:jmgibson@amp.com)).



## **F07/PN Comparison Matrix - 2**

	F07/PN
Duplex, asymmetric, differentiated (keying etc)	Yes / Yes
Support speeds from 125 MBaud up to 4GBaud	No (TBD from device mfrs) / TBD
Suitable for equipment, dongles and wall plates	Yes / Yes
Size compared with RJ45 aperture	2X
Worst-case loss (dB) per connection	2.0 dB / 2 dB
Performance complies to TIA 568 requirements	? / ?
Suitable for MMF(50 micrometre core, 125 micrometre OD)	Yes- 200/230um HCS / Yes (TBD)
Suitable for POF	Yes- 1000um plastic / Yes
Physical safety issues during installation	Exposed fibres during installation
Physical safety issues in normal operation	No / ?

## **F07/PN Comparison Matrix - 3**

	F07/PN
What is available for GOF	Conns for 200/230um HCS style fibers /
What is available for POF	Conns for 1000um POF. Transceivers (currently at 10Mb/s) / plug, adaptor TRX (S100)
What is under development for GOF	/ nothing
What is under development for POF	/ TRX(S200)
performance after 500 cycles	2.5dB max / TBD
performance after 1500 cycles	not rated / questionable
independent testing (including round robin) info	Connectors tested internally to AMP / not yet
number of vendors of the proposed connector	At least 3 companies offer the FO7 / more than 3
transceiver integration information	S100 available, S200 developing

Note: AMP has some of the cost information requested. However, discussion of specific cost information must be deferred to the AMP Legal Department, namely Jim Gibson (717-592-4769, email [jmgibson@amp.com](mailto:jmgibson@amp.com)).



## Direct Comparison Matrix - 1

	Direct
Mechanical Spec reference	T R -41, P E N D I N G
Patent letter filed with IEEE	Y E S - S E E ATTAC HE D
System cost compared to UTP-5	P OF = GOF +50%
Environmental endurance (as per FOTP)	YES
Installation cable termination complexity (describe)	As demonstrated
Maintenance required (describe)	None
Maintenance advised before connection (describe)	C LE A N F I B E R E N D S W I T H A L C O H O L
Protection from dust etc (describe)	Dust covers

Note: All costs are compared to approximate equivalent for UTP/RJ-45, as independently determined by the individual proposers

## Direct Comparison Matrix - 2

	Direct
Duplex, asymmetric, differentiated (keying etc)	YES Key could be added
Support speeds from 125 MBaud up to 4GBaud	YES - SEE ATTACHED SCHEDULE
Suitable for equipment, dongles and wall plates	YES
Size compared with RJ45 aperture	= SAME IDENTICAL FOOTPRINT
Worst-case loss (dB) per connection	POF 2.0dB GOF TBD, design target 0.75dB
Performance complies to TIA 568 requirements	?POF YES (ATM FORUM) GOF TBD (design goal)
Suitable for MMF(50 micrometre core, 125 micrometre OD)	YES - 50/125 OR 62.5/125
Suitable for POF	YES - SI POF OR GRIN POF
Physical safety issues during installation	Exposed fibres during installation
Physical safety issues in normal operation	NO EXPOSED FIBERS IN NORMAL USE

## **Direct Comparison Matrix - 3**

	Direct
What is available for GOF	
What is available for POF	S200 NOW,
What is under development for GOF	Jack and Plug - MAR '98
What is under development for POF	S400 MAR '98 S800/3200 TBD
performance after 500 cycles	TBD, design goal < 0.3 dB
performance after 1500 cycles	TBD, design goal < 0.3 dB
independent testing (including round robin) info	PENDING
number of vendors of the proposed connector	3 OTHERS PENDING
transceiver integration information	S200 NOW, S400 MAR '98, S800/3200 TBD

## **VF-45 Comparison Matrix - 1**

	VF-45
Mechanical Spec reference	PN-3968, FO-6.3, FOCIS 7 PN-4122 (TIA 47500AC)
Patent letter filed with IEEE	IEEE in process (filed with ANSI)
System cost compared to UTP-5	Approxiamte cost per line compared to UTP-5 is 1.48X, the cost per line is made under the following assupmtions with items listed: duplex cable, 1 jack, % of loaded patch panel, wall plate, and 2 patch cables
Environmental endurance (as per FOTP)	Yes, using glas optical fiber. The VF-45 is made of molded plastic pieces designed for durability and long life.
Installation cable termination complexity (describe)	As demonstrated
Maintenance required (describe)	None
Maintenance advised before connection (describe)	Use spray with HFE solution to clean
Protection from dust etc (describe)	Spring loaded door for VF-45 socket and slide door for VF-45 plug.

Note: All costs are compared to approximate equivalent for UTP/RJ-45, as independently determined by the individual proposers

## VF-45 Comparison Matrix - 2

	VF-45
Duplex, asymmetric, differentiated (keying etc)	The VF-45 only inserts one way, designed with RJ-45 latch. Key could be added
Support speeds from 125 MBaud up to 4GBaud	YES, using glass optical fiber.
Suitable for equipment, dongles and wall plates	Yes
Size compared with RJ45 aperture	VF-45 is comparable to RJ45.
Worst-case loss (dB) per connection	Typical loss 0.5dB, but less than 0.75dB.
Performance complies to TIA 568 requirements	YES, also IEC.
Suitable for MMF (50 micrometre core, 125 micrometre OD)	YES, 50 micron and 62.5 micron.
Suitable for POF	no
Physical safety issues during installation	Bare fiber handling is minimized during installation with polishing puck, slide doors on plug and socket and common tools are used during installation for familiarity.
Physical safety issues in normal operation	Fibres protected by plastic and shroud

## VF-45 Comparison Matrix - 3

	VF-45
What is available for GOF	Professional tool kit and VF-45 socket and plug assembly, media converters, transceiver, patch panels, wall plates, network electronics with VF-45 and test equipment.
What is available for POF	N/A
What is under development for GOF	Amateur tool kit.
What is under development for POF	N/A
performance after 500 cycles	Less than 0.3dB change
performance after 1500 cycles	Less than 0.3dB change (1000 cycles)
independent testing (including round robin) info	Beta trials in use and installed by local contractors. Beta's in USA, Europe and Japan.
number of vendors of the proposed connector	3M and several Licensees in process
transceiver integration information	10Mbps, 4/16mbps, 100Mbps, & Gigabit sampling . Licensing per ANSI requirements to ensure that networking vendors have products from multiple vendors. Transceiver is being incorporated in switched, HUB's and NIC's by multiple vendors. Transceiver VF-45 desing will be available under various protocols

## LC Comparison Matrix - 1

	LC
Mechanical Spec reference	We have submitted to TIA FO6.3 FOCIS (work item approved) and IEC 86B WG6 (Submission approved by USTAG)
Patent letter filed with IEEE	In process of filing letter with the IEEE.
System cost compared to UTP-5	1.2X to 1.5X for system consisting of connectors, patchcords, panels, outlets and cable.
Environmental endurance (as per FOTP)	YES
Installation cable termination complexity (describe)	As demonstrated
Maintenance required (describe)	None
Maintenance advised before connection (describe)	Clean before making a connection.
Protection from dust etc (describe)	A protective cap is provided on the connector and adapter.

Note: All costs are compared to approximate equivalent for UTP/RJ-45, as independently determined by the individual proposers

## LC Comparison Matrix - 2

	LC
Duplex, asymmetric, differentiated (keying etc)	Yes Has keying
Support speeds from 125 MBaud up to 4GBaud	Yes
Suitable for equipment, dongles and wall plates	Yes
Size compared with RJ45 aperture	Smaller than RJ45 but with mounting collar can be mounted in the same cut out as an
Worst-case loss (dB) per connection	max 0.4dB average 0.10 dB
Performance complies to TIA 568 requirements	YES, also IEC and Bellcore
Suitable for MMF (50 micrometre core, 125 micrometre OD)	Yes, and single mode
Suitable for POF	With some design work, the LC could become a POF connector, preliminary design work done
Physical safety issues during installation	Exposed fibres during installation
Physical safety issues in normal operation	Fibre protected by ferules. Also comply with UL-94 & Bellcore GR326

## *LC Comparison Matrix - 3*

	LC
What is available for GOF	Field mountable connector, duplex adapter (both standard height and low profile), patch cords, hybrid patch cords, panels, mounting collar for RJ45 cutout, tool kit, consumable kit and upgrade kit
What is available for POF	No POF products at this time.
What is under development for GOF	Many products are underdevelopment to finish out the LC product family such as attenuators, simplex adapters, among other products.
What is under development for POF	Preliminary work has been done on POF LC connector.
performance after 500 cycles	Product has been tested to 500 matings without failures (<0.2dB change)
performance after 1500 cycles	Product has been tested to 1000 matings without failures (<0.2 dB change)
independent testing (including round robin) info	several installed sites, over 50,000 installed connectors. Lucent has completed a significant amount of internal testing.
number of vendors of the proposed connector	One (1) today, with the potential of four (4) by the end of the year.
transceiver integration information	LC Front End drawings available now. Several companies are considering manufacturing an LC transceiver. More information should be available by the end of the year Lucent is committed to having an end to end LC solution. 155 and Gigabit in development

## *Mini-MT Comparison Matrix - 1*

	Mini-MT
Mechanical Spec reference	TIA PN- 4107; IEC NWIP accepted
Patent letter filed with IEEE	No, but willing
System cost compared to UTP-5	2-3X
Environmental endurance (as per FOTP)	TBD
Installation cable termination complexity (describe)	As demonstrated
Maintenance required (describe)	None
Maintenance advised before connection (describe)	Clean
Protection from dust etc (describe)	Standard covers

Note: All costs are compared to approximate equivalent for UTP/RJ-45, as independently determined by the individual proposers

Note: AMP has some of the cost information requested. However, discussion of specific cost information must be deferred to the AMP Legal Department, namely Jim Gibson (717-592-4769, email [jmgibson@amp.com](mailto:jmgibson@amp.com)).



## *Mini-MT Comparison Matrix - 2*

	Mini-MT
Duplex, asymmetric, differentiated (keying etc)	Yes Key could be added
Support speeds from 125 MBaud up to 4GBaud	Yes
Suitable for equipment, dongles and wall plates	Yes
Size compared with RJ45 aperture	Smaller
Worst-case loss (dB) per connection	.75dB
Performance complies to TIA 568 requirements	
Suitable for MMF (50 micrometre core, 125 micrometre OD)	Yes
Suitable for POF	No
Physical safety issues during installation	Exposed fibres during installation
Physical safety issues in normal operation	Fibre protected by ferrules

## *Mini-MT Comparison Matrix - 3*

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	Mini-MT
What is available for GOF	
What is available for POF	N/A
What is under development for GOF	
What is under development for POF	N/A
performance after 500 cycles	
performance after 1500 cycles	
independent testing (including round robin) info	
number of vendors of the proposed connector	5
transceiver integration information	Yes