ANT-20SE
Advanced Network Tester

ATM Mappings

BN 3060/90.52 and BN 3060/90.53

for ATM modul BN 3060/90.50
and Broadband Analyzer/Generator BN 3060/90.51

Software Version 7.20

Operating Manual

6

BN 3060/98.35

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Please direct all enquiries to your local Wavetek Wandel Goltermann sales company. The addresses are given at the end of this handbook.

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Contents

Specifications

Specifications

1 STM-1 C4, ATM in 155.52 Mbit/s mapping

This mapping structure is included in the following instrument versions and options:

- ATM Module, BN 3035/90.70
- Broadband Analyzer/Generator, BN 3035/90.80

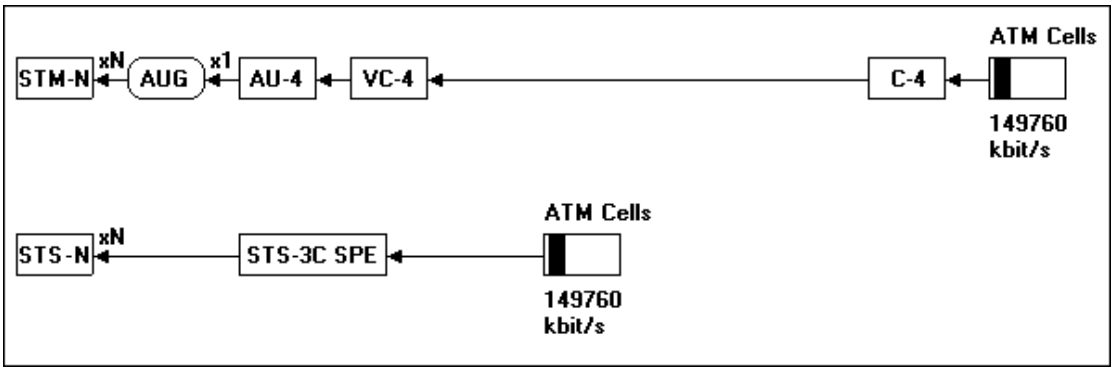

Fig. S-1 150 Mbit/s in STM-1/STS-3c ATM cell stream mapping structure

For the following topics please refer to the specifications of the “STM-1 Mappings” file:

- Overhead
- Alarm generation (defects)
- Error insertion (anomalies)
- Overhead evaluation
- Error measurement (anomalies)
- Alarm detection (defects)

2 STS-3c, ATM in 155.52 Mbit/s mapping

This mapping structure is included in the following instrument versions and options:

- ATM Module, BN 3035/90.70
- Broadband Analyzer/Generator, BN 3035/90.80

For the following topics please refer to the specifications of the “STS-1 Mapping” file (section “STS-3c Mapping”:

- Overhead
- Alarm generation (defects)
- Error insertion (anomalies)
- Overhead evaluation
- Error measurement (anomalies)
- Alarm detection (defects)

3 STS-1, ATM in 51.840 Mbit/s mapping

Option 3035/90.71

- Includes the ATM mapping for STS-1 in accordance with ITU-T G.707 and ANSI Draft T1.105.02-199X.

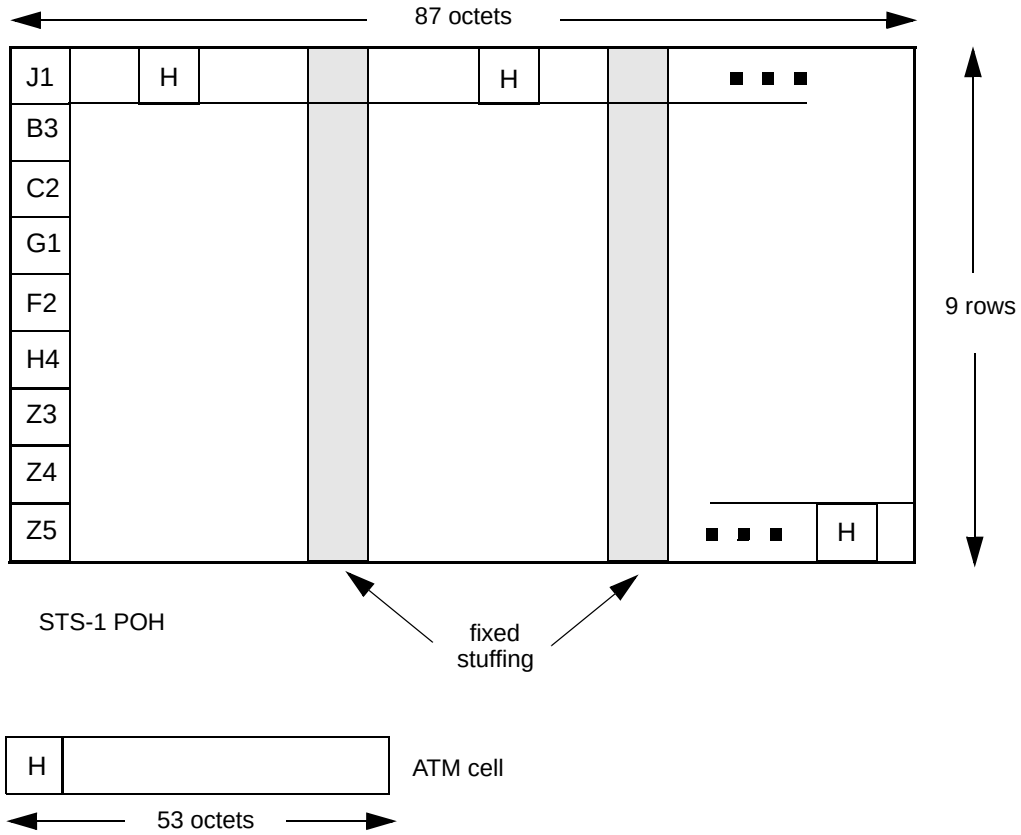

Fig. S-2 ATM mapping for STS-1 (51.840 Mbit/s)

For the following topics please refer to the specifications of the “STS-1 Mapping” file:

- Overhead
- Alarm generation (defects)
- Error insertion (anomalies)
- Overhead evaluation
- Error measurement (anomalies)
- Alarm detection (defects)

4 E4, ATM in 139.264 Mbit/s mapping

Option 3035/90.72

- Frames to G.832.
- ATM mapping to G.804.

4.1 Overhead

Overhead byte	Option 3035/90.72
FA1(hex)	“F6”
FA2 (hex)	“28”
EM (hex)	Inserted via parity formation
TR (ASCII)	“WG E4-TRACE”
MA (hex)	“10”
NR (hex)	“00”
GC (hex)	“00”
P1 (hex)	“00”
P2 (hex)	“00”

Table S-1 Overhead contents

4.2 Alarm generation (defects)

The following alarm types (defects) can be generated:

Defect	Sensor function test	Sensor thresholds
	On/Off	M in N
AIS	Yes	-
LOF	Yes	M = 1 to N-1; N = 1 to 8001
RDI	Yes	M = 1 to N-1; N = 1 to 8001
UNEQ	Yes	M = 1 to N-1; N = 1 to 8001
PLM	Yes	M = 1 to N-1; N = 1 to 8001
TIM	ja	-

Table S-2 Available alarm types (defects)

4.3 Error insertion (anomalies)

Trigger modes . . . . . Single or Rate

Error type, anomaly	Single	Rate
FAS	Yes	2E-3 to 1E-8
EM (BIP-8)	Yes	2E-3 to 1E-10
REI	Yes	5E-5 to 1E-10

Table S-3 Available error types (anomalies) and trigger modes

4.4 Error measurement (anomalies)

The following anomalies can be evaluated and displayed in addition to those described in the Mainframe “Specifications”.

Anomaly	LED
FAS	FAS
EM (BIP-8)	B1/B2
REI	-

Table S-4 LED indication of possible anomalies

4.5 Alarm detection (defects)

The following defects can be evaluated and displayed in addition to the alarm types described in the Mainframe “Specifications”.

Defect	LED
AIS	AIS
LOF	LOF/OOF
RDI	RDI
UNEQ	HP-UNEQ
PLM	HP-PLM
TIM	-

Table S-5 LED indication of possible defects

5 E3, ATM in 34.368 Mbit/s mapping

Option 3035/90.74

- Frames to G.832.
- ATM mapping to G.804

5.1 Overhead

Overhead byte	Option 3035/90.74
FA1(hex)	“F6”
FA2 (hex)	“28”
EM (hex)	Inserted via parity formation
TR (ASCII)	“WG E3-TRACE
MA (hex)	“10”
NR (hex)	“00”
GC (hex)	“00”

Table S-6 Overhead contents

5.2 Alarm generation (defects)

The following alarm types (defects) can be generated:

Defect	Sensor function test	Sensor thresholds
	On / Off	M in N
AIS	Yes	-
LOF	Yes	M = 1 to N-1; N = 1 to 8001
RDI	Yes	M = 1 to N-1; N = 1 to 8001
UNEQ	Yes	M = 1 to N-1; N = 1 to 8001
PLM	Yes	M = 1 to N-1; N = 1 to 8001
TIM	Yes	-

Table S-7 Available alarm types (defects)

5.3 Error insertion (anomalies)

Trigger modes . . . . . Single or Rate

Error type, anomaly	Single	Rate
FAS	Yes	2E-3 to 1E-8
EM (BIP-8)	Yes	2E-3 to 1E-10
REI	Yes	2E-4 to 1E-10

Table S-8 Available error types (anomalies) and trigger modes

5.4 Error measurement (anomalies)

The following anomalies can be evaluated and displayed in addition to the error types available in the Mainframe.

Anomaly	LED
FAS	FAS
EM (BIP-8)	B1/B2
REI	-

Table S-9 LED indication of possible anomalies

5.5 Alarm detection (defects)

The following defects can be evaluated and displayed in addition to the alarm types available in the Mainframe.

Defect	LED
AIS	AIS
LOF	LOF/OOF
RDI	RDI
UNEQ	HP-UNEQ
PLM	HP-PLM
TIM	-

Table S-10 LED indication of possible defects

6 E1, ATM in 2.048 Mbit/s mapping

Option 3035/90.75

- ATM mapping according to ITU-T G.804.

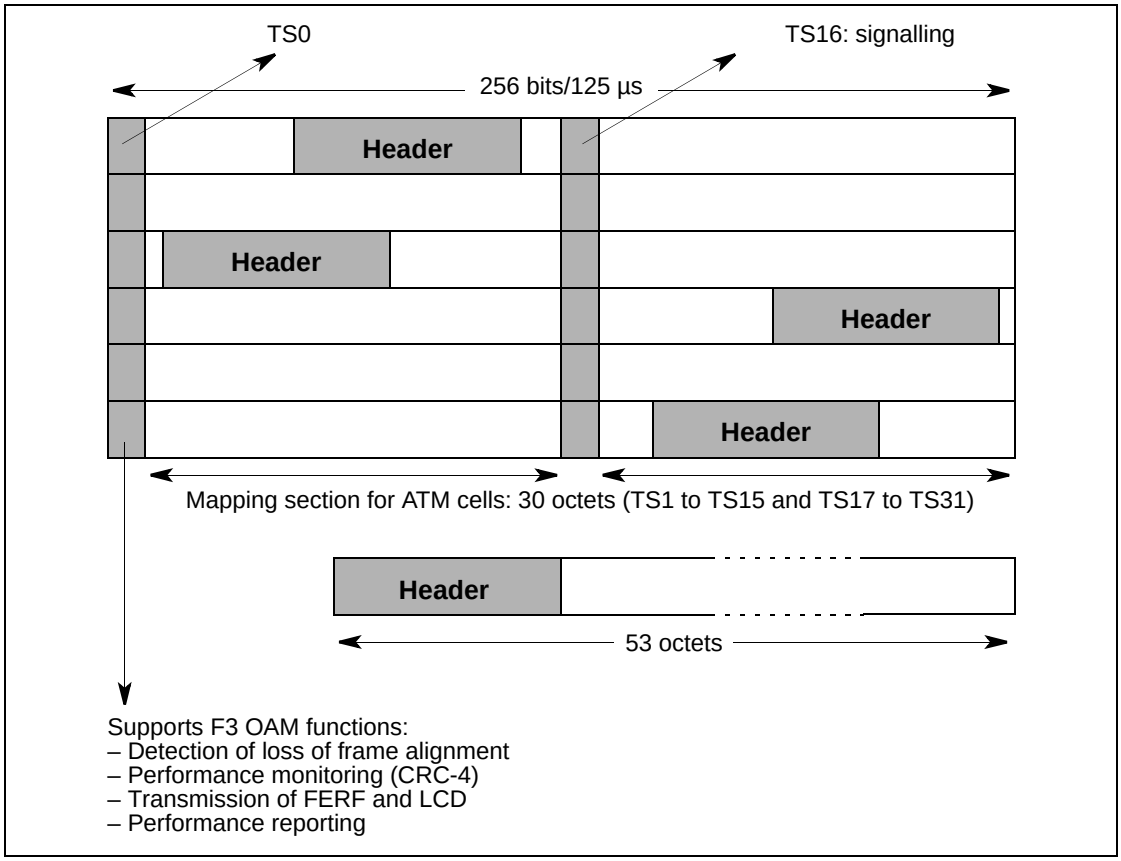

Fig. S-3 ATM mapping for E1 (2048 kbit/s)

For the following topics please refer to the specifications of the “STM-1-Mapping” file:

- Alarm generation (defects)
- Error insertion (anomalies)
- Error measurement (anomalies)
- Alarm detection (defects)

7 DS3, ATM in 44.736 Mbit/s mapping (PLCP, HEC based)

Option 3035/90.73

7.1 PLCP-based Mapping

The ATM cells are firs mapped into PLCP frames (Physical Layer Convergence Protocol) as per G.804. The PLCP frame slips bit-synchronously (Nibble-aligned floating-4 bit) into DS3 C Parity frames as per G.804 (G.704). For more information refer to the specifications of the “STS-1 Mapping” file (section “DS3 Mapping”):

7.1.1 Overhead

DS3: PLCP based ATM mapping

O H						
	1	**2**	**3 (POI)**	**4 (POH)**	**5**	**6**
1	A1 F6	A2 28	P11 2C	Z6 00	ATM Cell	
2	A1 F6	A2 28	P10 29	Z5 00	ATM Cell	
3	A1 F6	A2 28	P09 25	Z4 00	ATM Cell	
4	A1 F6	A2 28	P08 20	Z3 00	ATM Cell	
5	A1 F6	A2 28	P0 1C	Z2 00	ATM Cell	
6	A1 F6	A2 28	P06 19	Z1 00	ATM Cell	
7	A1 F6	A2 28	P05 15	X 00	ATM Cell	
8	A1 F6	A2 28	P04 10	B1	ATM Cell	
9	A1 F6	A2 28	P03 0D	G1 00	ATM Cell	
10	A1 F6	A2 28	P02 08	X 00	ATM Cell	
11	A1 F6	A2 28	P01 04	X 00	ATM Cell	
12	A1 F6	A2 28	P00 01	C1	ATM Cell	Trailer C

All values are hexadecimal.

B1 is formed from the POH and ATM cells of the 12 rows of the previous frame.

7.1.2 Alarm generation (defects)

The following alarm types (defects) can be generated:

Defect	Sensor function test	Sensor thresholds
	on/off	M in N
AIS_DS3	yes	-
IDLE_DS3	yes	-
LOF_DS3	yes	-
YELLOW_DS3 (RDI)	yes	-
PLCP_LOF	yes	M = 1 to N-1; N = 1 to 8000
PLCP_RAI	yes	

Table S-11 Available alarm types (defects)

7.1.3 Error insertion (anomalies)

Trigger types . . . . . Single error, error rate

Error type, anomaly	Single	Rate
FE_DS3	yes	-
Parity_DS3	yes	-
FEBE_DS3	yes	-
PLCP_FAS	yes	1E-3 to 1E-7
PLCP_B1	yes	1E-3 to 1E-8
PLCP_REI(FEBE)	yes	1E-3 to 1E-8

Table S-12 Available error types (anomalies) and trigger types

7.1.4 Error measurement (anomalies)

The following error types can be displayed and evaluated in addition to the error types provided by the Mainframe.

Anomaly	**LED**
FE_DS3, MFE_DS3	FAS/CRC
P_DS3, CP_DS3	-
FEBE_DS3	-
PLCP_FAS	FAS/CRC
PLCP_B1	B1/B2
PLCP_REI (FEBE)	-

Table S-13 LED display of possible anomalies

7.1.5 Alarm detection (defects)

The following alarms can be displayed and evaluated in addition to the defects provided by the Mainframe.

Defect	**LED**
AIS_DS3	AIS
LOF_DS3, OOF_DS3	LOF/LCD
YELLOW_DS3	RDI
IDLE_DS3	-
PLCP_LOF	LOF/LCD
PLCP_RAI	-

Table S-14 LED display of possible defects

7.2 HEC-based Mapping

The G.704 multiframe is used for HEC-based mapping of ATM cells into 44.736 Mbit/s as per G.804.

7.2.1 Alarm generation (defects)

Defect	**Sensor function test**
	on/off
AIS_DS3	yes
IDLE_DS3	yes
LOF_DS3	yes
YELLOW_DS3 (RDI)	yes

Table S-15 Alarm generation (defects): Available alarm types

7.2.2 Error insertion (anomalies)

Error type, anomaly	**Single**
FE_DS3	yes
Parity_DS3	yes
FEBE_DS3	yes

Table S-16 Error insertion (anomalies): Available error types and trigger types

7.2.3 Error measurement (anomalies)

Anomaly	**LED**
FE_DS3, MFE_DS3	FAS/CRC
P_DS3, CP_DS3	-
FEBE_DS3	-

Table S-17 Error measurement (anomalies): LED display of possible anomalies

7.2.4 Alarm detection (defects)

Defect	LED
AIS	AIS
LOF_DS3, OOF_DS3	LOF/LCD
YELLOW_DS3	RDI
IDLE_DS3	-

Table S-18 Alarm detection (defects): LED display of possible defects

8 DS1, ATM in 1.544 Mbit/s mapping

Option 3035/90.76

8.1 Alarm generation (defects)

Defect	Sensor function test
	on/off
AIS_DS1	yes
LOF_DS1	yes
YELLOW_DS1	yes

Table S-19 Alarm generation (defects): Available defects

8.2 Error insertion (anomalies)

Trigger types . . . . . .Single error

Anomaly	Single
FE_DS1	yes
CRC6	yes

Table S-20 Error insertion (anomalies): Available anomalies and trigger mode

8.3 Error measurement (anomalies)

The following error types can be displayed and evaluated in addition to the error types provided by the Mainframe.

Anomaly	LED
FE_DS1	FAS/CRC
CRC6	FAS/CRC

Table S-21 Error measurement (anomalies): LED display of available anomalies

8.4 Alarm detection (defects)

The following alarms can be displayed and evaluated in addition to the defects provided by the Mainframe.

Defect	**LED**
AIS_DS1	AIS
LOF_DS1, OOF_DS1	LOF/LCD
YELLOW_DS1	RDI

Table S-22 Alarm detection (defects): LED display of available defects

9 STM-1 C3, ATM in 155.52 Mbit/s mapping

Option 3035/90.77

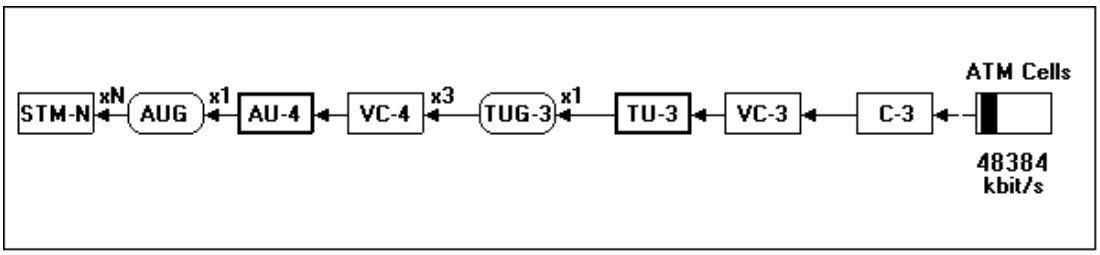

Fig. S-4 Mapping structure AU-4: ATM → C-3 → AU-4 → STM-1

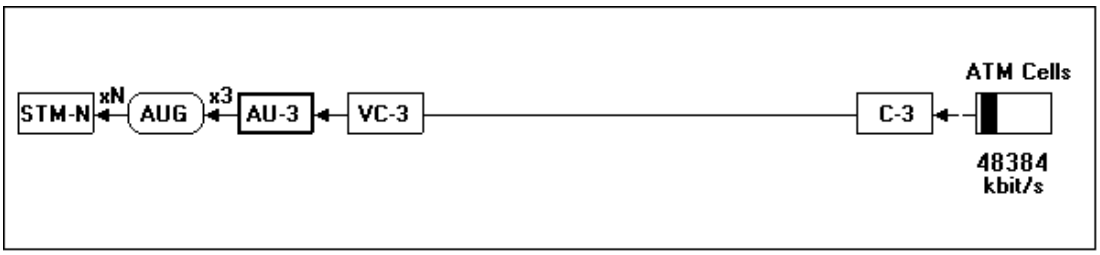

Fig. S-5 Mapping structure AU-3: ATM → C-3 → AU-3 → STM-1

For the following topics please refer to the specifications of the “STM-1Mapping” file:

- Overhead
- Alarm generation (defects)
- Error insertion (anomalies)
- Overhead evaluation
- Error measurement (anomalies)
- Alarm detection (defects)

10 STS-1 SPE, ATM in 44.736 Mbit/s mapping

see Sec. 3, Page S-3 and Sec. 7, Page S-9

11 VC3, ATM in 44.736 Mbit/s mapping

see Sec. 7, Page S-9 and Sec. 9, Page S-16

12 Note for ANT-20SE users

The following hardware and software bundles have been formed for the ANT-20SE.

Assignments of modules and software ANT-20SE – ANT-20/ANT-20E:

	Module / Software	BN number ANT-20SE	Equivalent BN number
ANT-20SE Mainframe	Mainframe, SDH	3060/01	3035/41 or 3035/21 + 3035/92.15 + 3035/93.11 + 3035/90.01
	Mainframe, SONET	3060/02	3035/42 or 3035/22 + 3035/92.15 + 3035/93.11 + 3035/90.10
	Extended SDH Testing	3060/90.01	3035/90.02, 3035/90.03, 3035/90.04, 3035/90.05, 3035/90.06, 3035/90.15
	Extended SONET Testing	3060/90.02	3035/90.11, 3035/90.12, 3035/90.13, 3035/90.03, 3035/90.15
	Add SONET (SONET expansion for SDH mainframe)	3060/90.03	3035/90.10, 3035/90.11, 3035/90.12, 3035/90.13, 3035/90.34
	Add SDH (SDH expansion for SONET mainframe)	3060/90.04	3035/90.01, 3035/90.02, 3035/90.04, 3035/90.05, 3035/90.06, 3035/90.33
	Drop&Insert (Through mode, Block&Replace)	3060/90.10	3035/90.20
	PDH MUX/DEMUX (64/140)	3060/90.11	3035/90.30
	M13 MUX/DEMUX	3060/90.12	3035/90.32
Optics STM-1/4, OC-1/3/12	STM-1, OC-1/3 1310 nm	3060/91.01	3035/90.43 + 2 Adapters
	STM-1, OC-1/3 1310 nm & 1550 nm	3060/91.02	3035/90.45 + 2 Adapters
	STM-1/4, OC-1/3/12 1310 nm	3060/91.11	3035/90.46 + 2 Adapters
	STM-1/4, OC-1/3/12 1310 nm & 1550 nm	3060/91.12	3035/90.48 + 2 Adapters
	Optical power splitter	3060/91.05	3035/90.49 + 3 Adapters
	OC-12c BULK	3060/90.90	3035/90.90
	OC-12c Virtual concatenation	3060/90.92	3035/90.92

Table O-23 Assignments of modules and software

	Module / Software	BN number ANT-20SE	Equivalent BN number
Optics STM-16, OC-48	STM-16, OC-48 1550 nm	3060/91.50	3035/91.53 + 2 Adapters
	STM-16, OC-48 1310 nm	3060/91.51	3035/91.54 + 2 Adapters
	STM-16, OC-48 1310 nm & 1550 nm	3060/91.52	3035/91.59 + 2 Adapters
	STM-16, OC-48 15... nm, special	3060/91.53	3035/90.38 + 2 Adapters
	OC-48c BULK	3060/90.93	3035/90.93
	Package: STM-0/1/4/16 1310 nm + Concatenation	3060/90.55	3035/90.46, 3035/91.54, 3035/90.90, 3035/90.93, + 4 Adapters
	Package: STM-0/1/4/16 1550 nm + Concatenation	3060/90.56	3035/90.47, 3035/91.53, 3035/90.90, 3035/90.93, + 4 Adapters
	Package: STM-0/1/4/16 1310 nm & 1550 nm + Concatenation	3060/90.57	3035/90.48, 3035/91.59, 3035/90.90, 3035/90.93, + 4 Adapters
	Package: STM-0/1/4 1310 nm STM-16 1550 nm + Concatenation	3060/90.58	3035/90.46, 3035/91.53, 3035/90.90, 3035/90.93, + 4 Adapters
Jitter O.172	Package: O.172 Jitter/Wander up to 155 Mbit/s	3060/91.30	3035/90.81, 3035/90.85, 3035/90.82, 3035/90.86
	Package: O.172 Jitter/Wander up to 622 Mbit/s	3060/91.31	3035/91.31
	Package: O.172 Jitter/Wander up to 2488 Mbit/s	3060/91.32	3035/91.32
	MTIE/TDEV Analysis Part of 3060/91.30 to 91.32	-	3035/95.21
ATM	ATM Basic	3060/90.50	3035/90.70
	ATM Comprehensive	3060/90.51	3035/91.80
	Add ATM SDH	3060/90.52	3035/90.72, 3035/90.74, 3035/90.75, 3035/90.77, 3035/90.33
	Add ATM SONET	3060/90.53	3035/90.71, 3035/90.73, 3035/90.76, 3035/90.34,
	OC-12c ATM Testing	3060/90.91	3035/90.91
Accessories	Remote control, V.24	3035/91.01	
	Remote control, GPIB	3035/92.10	
	Remote Operation Modem	3035/95.30	
	Remote Operation LAN/PCMCIA	3035/95.31	
	PDH/SDH NEXT Expert	3035/95.40	
	Test Sequencer	3035/95.90	
	LabWindows/CVI drivers	3035/95.99	
	Calibration report	3035/94.01	
	Transport case	3035/92.03	

Table O-23 Assignments of modules and software