

(ITU-R 269/4)

(2005)

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.(IPoS)

TIA-1008

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.EN 301 790

(ETSI)

DVB-RCS

.(ETSI)

BSM/RSM-A

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2 (TIA) (IPoS) IP -
 (2000) (ETSI) DVB -

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.4 ETSI BSM/RSM-A

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ETSI RSM-A TIA-1008 ETSI EN 301 790 V.1.3.1

ETSI RSM-A	TIA-1008	ETSI EN 301 790	
CE-OQPSK	CE-OQPSK	QPSK	
TDMA	DVB-S	DVB-S	
400 133,33 100	45 1	45 1	(Mbit/s)
FDMA-TDMA	MF-TDMA	MF-TDMA	
kbit/s 512 kbit/s 128 Mbit/s 16 Mbit/s 2	kbit/s 128 kbit/s 64 kbit/s 256		
IETF IP		DVB/MPEG2-TS P/AAL5/ATM	

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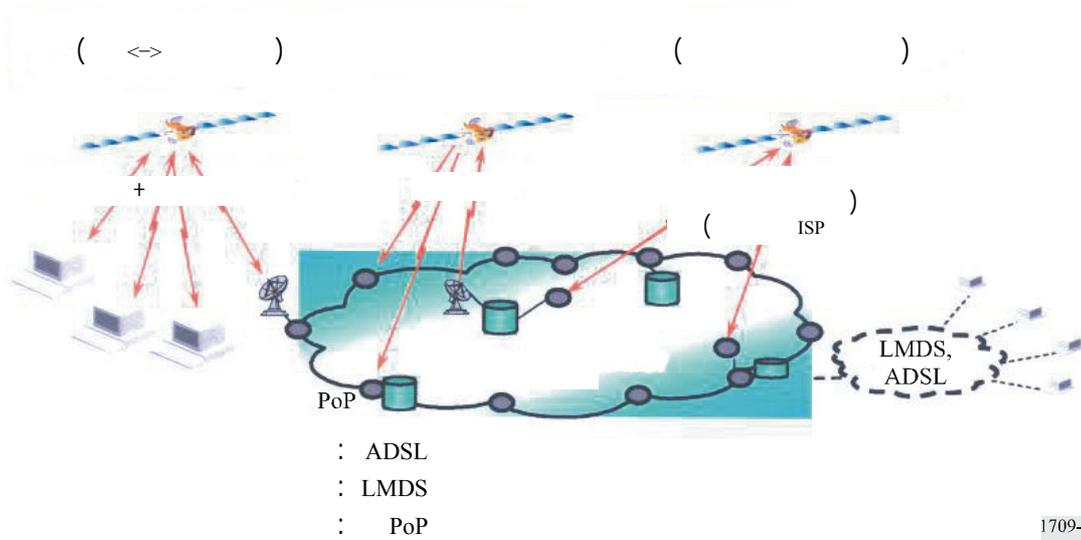
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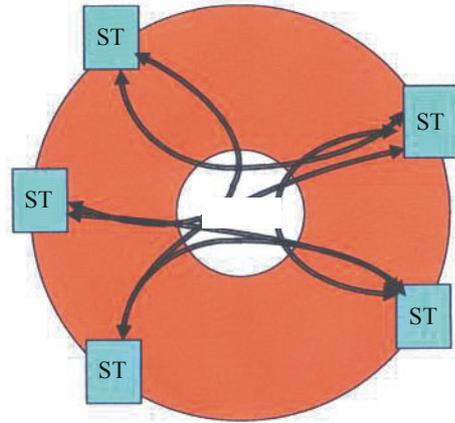
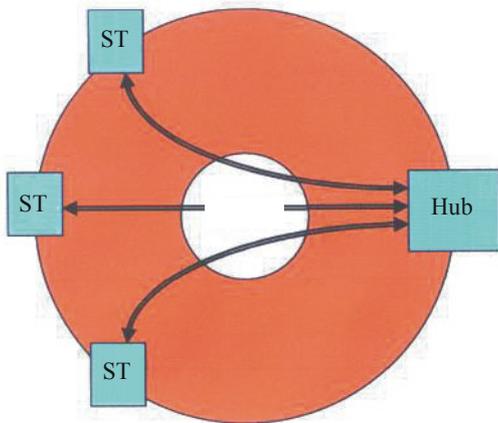
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3.2

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1709-02
= ST / = Hub

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.(bent-pipe architecture)

4.2

IP

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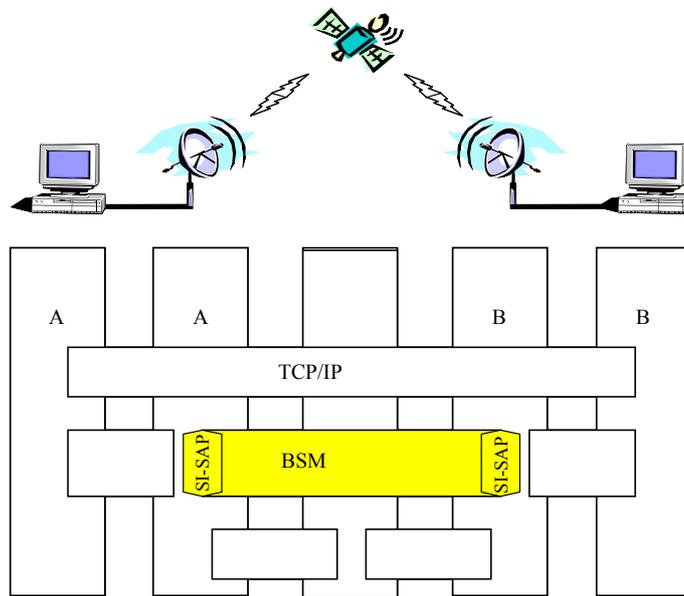
(ETSI)

(BSM)

(SI-SAP)

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:TCP

IETF IP

IP

SI-SAP

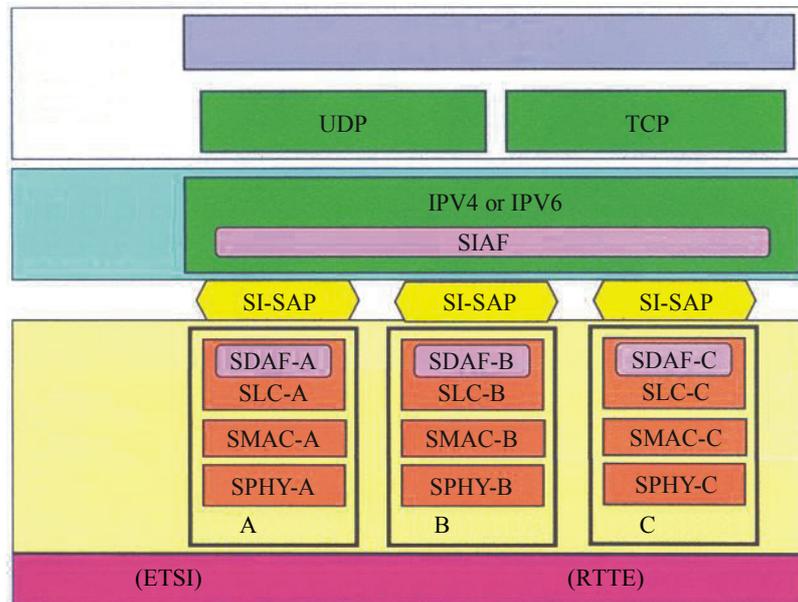
(4)

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(SDAF)

SI-SAP
.SI-SAP

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1709-04

:SIAF

:UDP

(SI)

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(SD)

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.IP

IP

6.2

IP

IP

IP

IP

.5

IP

SI-SAP

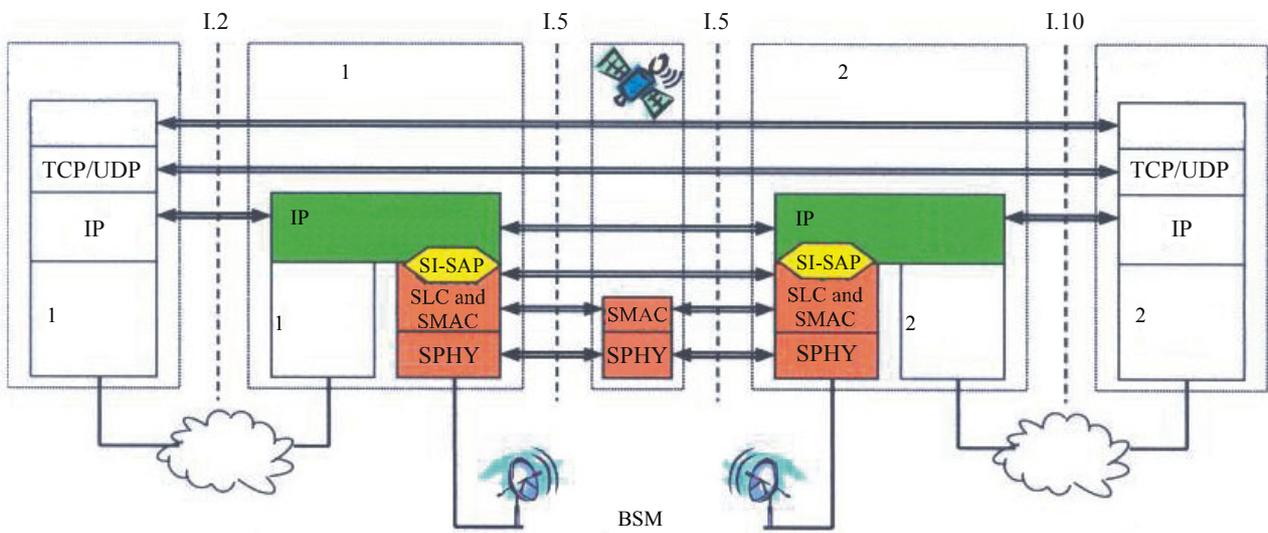
IP

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IP

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IP



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TIA-1008

http://www.itu.int/md/meetingdoc.asp?type=sitems&lang=e&parent=R03-WP6S-C-0031	2003			TIA-1008	TIA

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DVB-RCS

http://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=15626	2003	Published	V1.3.1	EN 301 790	ETSI	

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ETSI-SES/BSM/RSM-A

http://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=20888	2004		V1.1.2	ETSI TS 102-188-1	ETSI	
http://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=20892	2004		V1.1.2	ETSI TS 102-188-2	ETSI	
http://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=20893	2004		V1.1.2	ETSI TS 102-188-3	ETSI	
http://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=20895	2004		V1.1.2	ETSI TS 102-188-4	ETSI	
http://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=20896	2004		V1.1.2	ETSI TS 102-188-5	ETSI	

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<i>(Access control field)</i>	ACF
<i>(Ack-return)</i>	ACK-RET
<i>(Bandwidth on demand)</i>	BoD
<i>(Binary phase shift keying)</i>	BPSK
<i>(Broadband satellite multimedia)</i>	BSM
<i>(Class of service)</i>	CoS
<i>(Constant rate)</i>	CR
<i>(Cyclic redundancy check)</i>	CRC
<i>(Constant rate with burst)</i>	CRWB
<i>(Data link layer)</i>	DLL
<i>(Digital video broadcast)</i>	DVB

			(Extended data unit)	EDU
			(Frequency division multiple access)	FDMA
			(Forward error correction)	FEC
			(Geosynchronous Earth orbit)	GEO
			(High priority burst)	HPB
			(High volume up-link)	HVUL
			(Internet protocol)	IP
			(Kilobits per second (thousands of bits per second)) ()	kbit/s
			(Local area network)	LAN
			(Low volume low latency)	LVLL
			(Monitoring and control)	M&C
			(Medium access control)	MAC
			(Megabits per second (millions of bits per second)) ()	Mbit/s
			(Multicast group ID)	MGID
			(Network control centre)	NCC
			(Normal priority burst)	NPB
			(Offset quaternary phase shift keying)	OQPSK
			(Persistent aloha) Aloha	PA
			(Program clock reference)	PCR
			(Packet delivery service)	PDS
			(Protocol data unit)	PDU
			(Performance enhancing proxy)	PEP
			(Physical) ()	PHY
			(Packet IDentifier)	PID
			(Pseudo-random number)	PN
			(Packet transmission opportunity)	PTO
			(Point-to-point)	P-P
			(Quality of service)	QoS
			(Quaternary phase shift keying)	QPSK
			(Radio frequency)	RF
			(Reed-Solomon) -	RS
			(Regenerative satellite mesh)	RSM
			(Slotted aloha) Aloha	SA
			(Security access module)	SAM
			(Service access point)	SAP
			(Service data unit)	SDU

	(Satellite earth station)	SES
	(Satellite independent-SAP)	SI-SAP
	(Satellite link control)	SLC
	(Satellite MAC)	SMAC
	(Satellite terminal)	ST
	(Terminal burst time plan)	TBTP
	(Transmission control protocol)	TCP
	(Time-slot composition table)	TCT
	(Time division multiplexing)	TDM
	(Time division multiple access)	TDMA
	(Terminal information message)	TIM
	(Up-link data channel)	UDC
	(User data protocol)	UDP
	(User data transport services)	UDTS
	(Uplink power control)	ULPC
	(Unique word)	UW
	(Voice-over-IP) (IP)	VoIP

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(IPoS) TIA-1008

11	1
11	2
11	1.2
12	2.2
13	3.2
13 IPoS	3
13 IPoS	1.3
15	2.3
15 (PHY)	3.3
15	4.3

15	5.3
16 (DLL)	6.3
16 (SLC)	7.3
16 (MAC)	8.3
17	9.3
17	10.3

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(TIA) (IPoS)
) IPoS
 IP DVB (DVB " "
 IPoS
 .(DVB/MPEG) /

3 IPoS 2 .IPoS

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1.2

: IPoS

: .1

(bent-pipe) : .2

IPoS
 (GHz 8/7 GHz 30/20 GHz 11-14/10 GHz 6/4)

IPoS (PHY) -
 .(FSS) GHz 11-14/10 IPoS

IPoS : .3

IP

(PC)

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 . (USB)

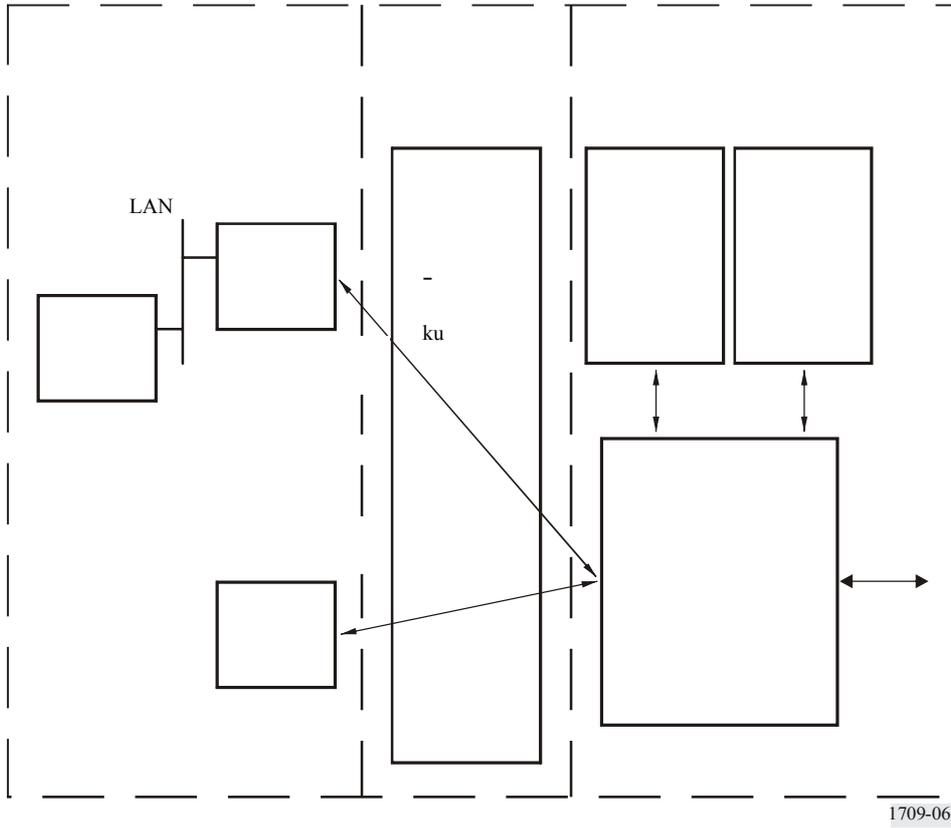
.IPoS : (LAN) -

IPoS 6

.IPoS

6

(IP)



1709-06

2.2

:IPoS

: LAN -

LAN

:IPoS -

IPoS

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IP

: IPoS

IPoS

IPoS

IPoS

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3.2

.IPoS

IPoS

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USB

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.IPoS

.(SOHO)

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.IPoS

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.IPoS

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IPoS

IPoS

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IPoS

1.3

IP

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IPoS

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(MF-TDMA)

IPoS

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IPoS

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(DLL)

6.3

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.IPoS

(DLL)

(SLC)

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(MAC)

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(SLC)

7.3

(DLC)

(SLC)

IPoS

SLC

($10^{-10} =$)

SLC

: SLC

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(IP PDU)

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PDU

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" "

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(MAC)

8.3

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MAC

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MAC

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:MAC

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DLC

DLC

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IPoS

.(DVB/MPEG)

DVB/MPEG

.(PID)

PID

PID

IPoS

:IPoS

IPoS

IPoS

(PSI)

:1

.IPoS

IPoS

PSI

.IPoS

IPoS

:2

.IPoS

IPoS

IPoS

IPoS

DVB/MPEG

.MAC

10.3

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IP

:IP

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IP

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.IPoS

:PEP

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(TCP)

(PIM-SM) IP

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IPoS

.IPoS

3

ETSI EN 301 790 V1.3.1

19		1
19		2
19	1.2	
20	2.2	
21	3.2	
22		3
22		4
22 RCST	1.4	
22	1.1.4	
23	.....	2.1.4	
23	.....	3.1.4	
23	.....	4.1.4	
23	.....	2.4	
23	.....	1.2.4	
25	.....	2.2.4	
25	.....	3.4	
25	..... (MAC)	4.4	
26		5
28		6
28 (CRA)	1.6	
28 (RDBC)	2.6	
28 (VBDC)	3.6	
28 (AVBDC)	4.6	
28 (FCA)	5.6	
29		7
29 (MF-TDMA)	1.7	
29		8

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(DVB-RCS)

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Turbo : / -

(RCST) -

(ATM) -

MPEG2-TS -

(MAC) -

DVB-S -

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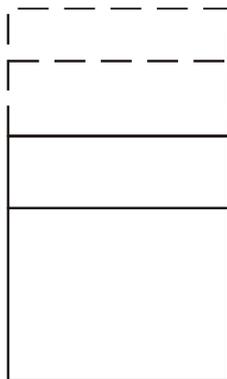
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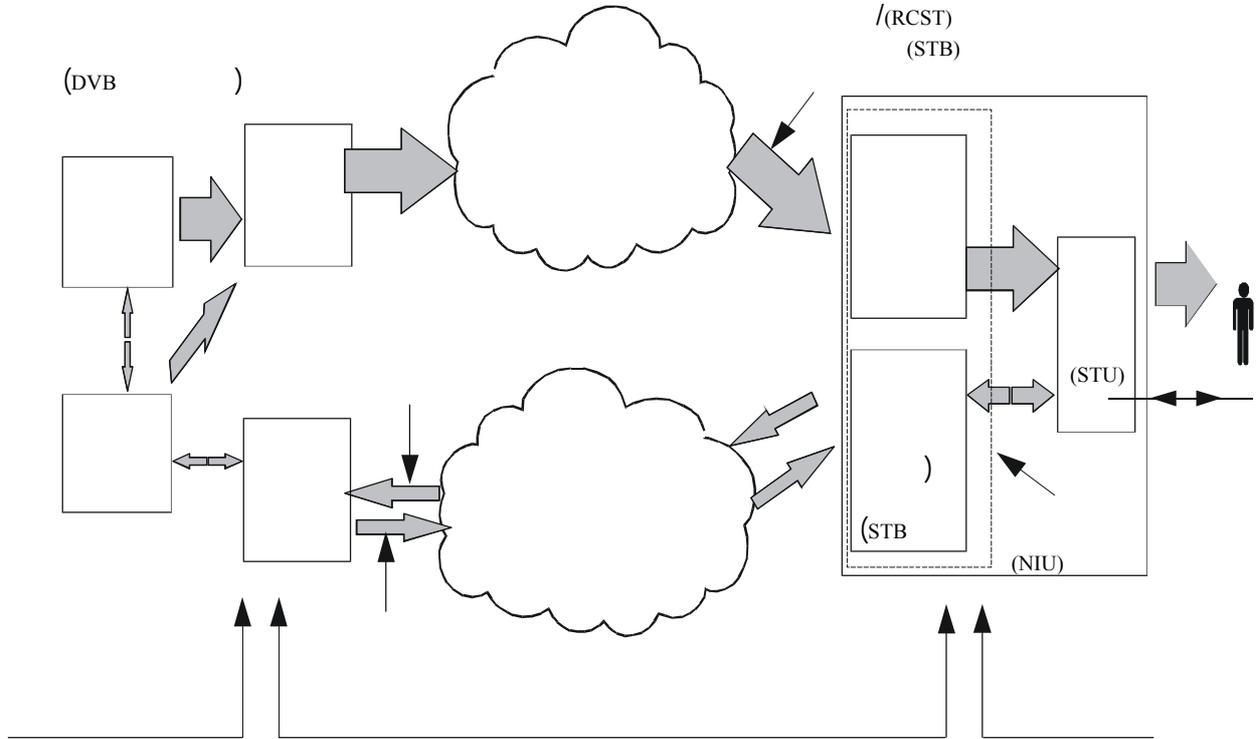
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RCST

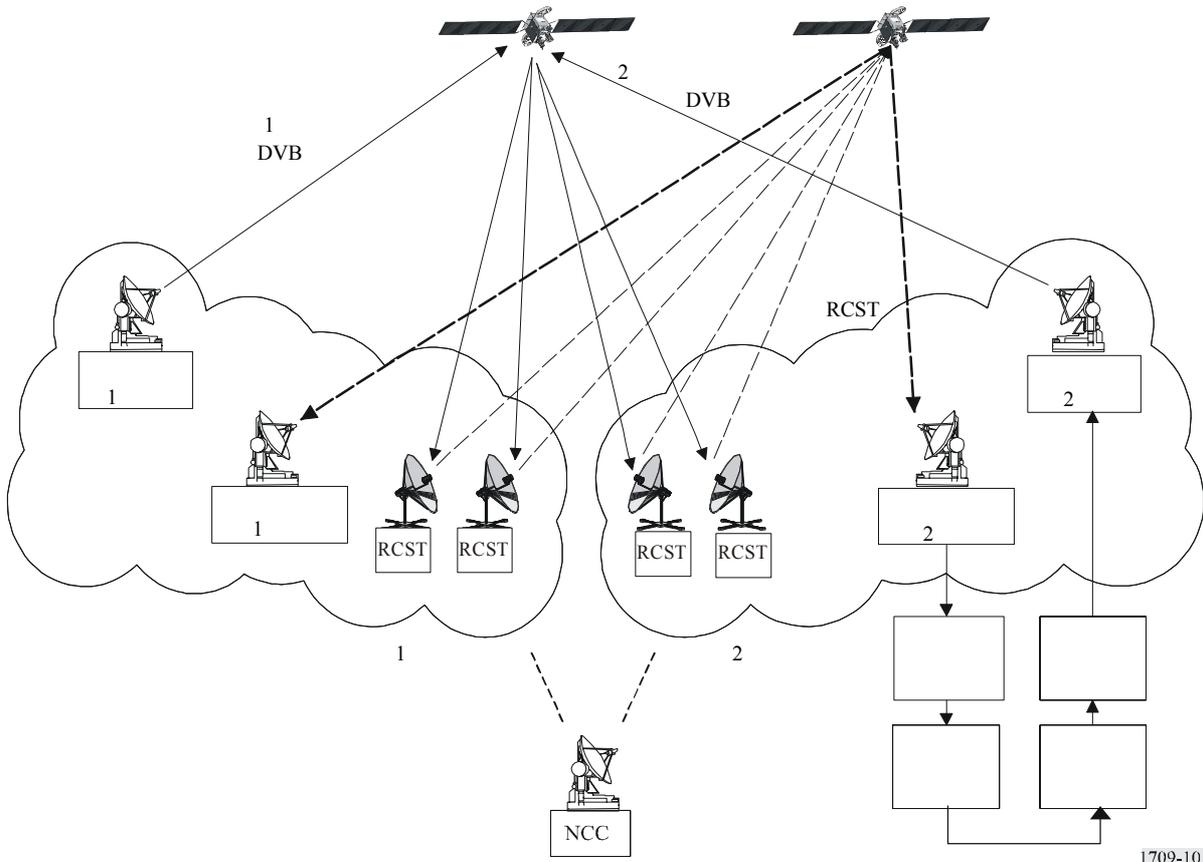
(RCST)

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RCST

RCST
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 :(NCC)
 RCST : (TG)
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 .(PSTN ISDN) (.
 :
 / (DVB-S)

10

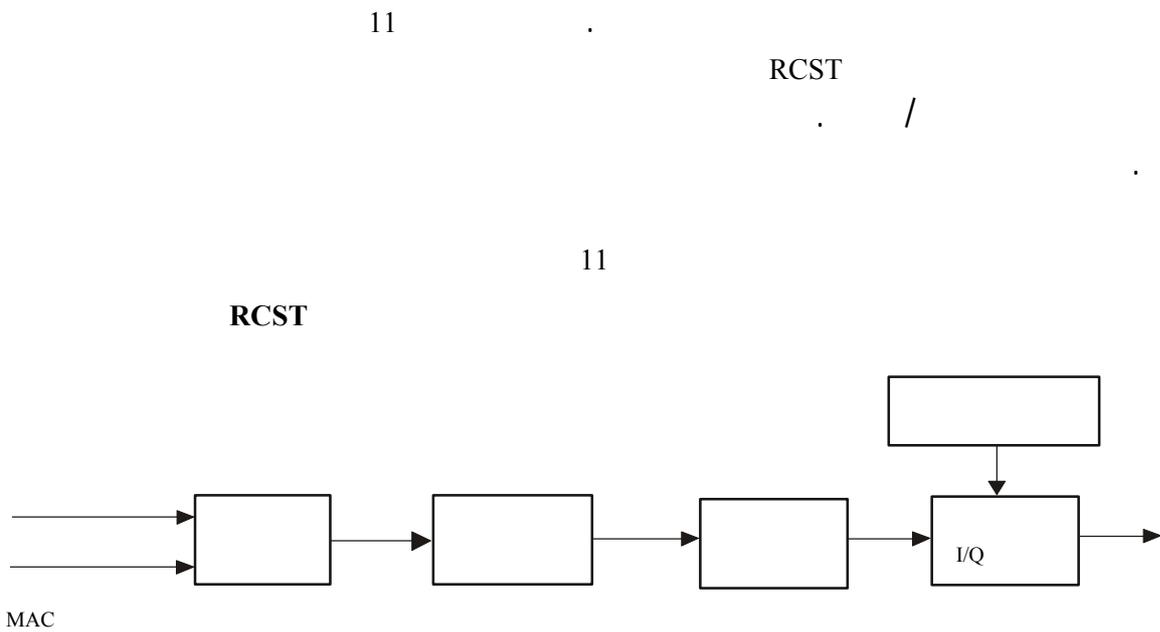


1709-10

= NCC /

= RCST

RCST
 " " NCC
 RCST NCC
 RCST
 3
 TR 101 202 EN 300 421 RCST
 .ETR 154 EN 301 192 EN 300 468 ETS 300 802
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RCST 1.4

1.1.4

RCST

RCST

TDMA

NCC

.RCST

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(NCR)

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.DVB/MPEG2-TS

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MPEG2

PID

NCR

ISO/IEC 13818-1

PCR

NCR

NCC

NCR

MPEG

.ppm 5

2.1.4

NCR
 RCST
 .(MPEG-2 TS)
 .RCST
 MPEG
 .NCR
 RCST
 .()⁸⁻¹⁰
 NCC
 MPEG-2 TS
 MHz 27
 NCR
 RCST

3.1.4

RCST
 RCST
 BTP
 NCR
 RCST
 RCST
 NCR
 NCR
 BTP
 (BTP)
 (NCR)
 NCC
 .BTP
 NCR
 %50
 NCR
 NCR
 TBTP
 DVB
 RCST
 RCST
 NCR
 NCR
 NCR

4.1.4

NCR
 RCST
 ppm 20
 .TCT
 1/20
 (SYNC)
 (ACQ)
 (TRF)
 :
 .(CSC)

2.4

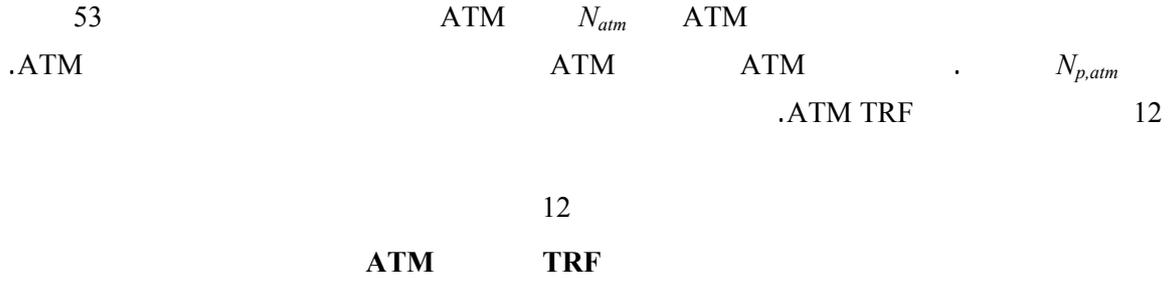
.MPEG-2 TS
 RCST
 (ATM)
 (TRF)
 TRF

1.2.4

ATM

TRF

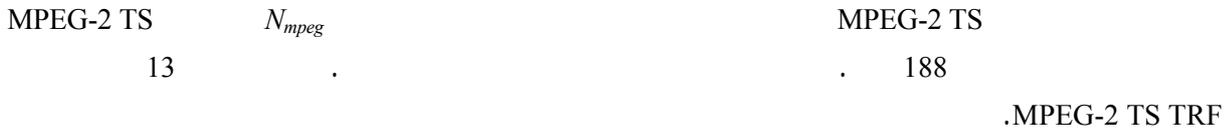
1.1.2.4



1709-12

MPEG-2 TS

2.1.2.4



1709-13

TRF

MPEG2

RCST

MPEG-2 TS TRF

TCT

.CSC

NCC

RCST

2.2.4

RCST
(ACQ SYNC)

(SYNC)

1.2.2.4

$N_{p, sync}$

(SAC)

SYNC

RCST

SYNC

SYNC

TRF

.SYNC

14

.NCC

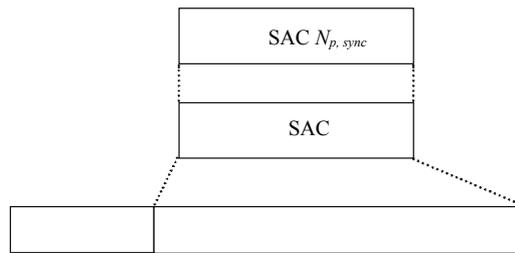
SYNC

SYNC

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14

SYNC



1709-14

3.4

QPSK

(MAC)

4.4

RCST

RCST

(M&C)

(TIM)

(SAC)

ATM TRF

SYNC

RCST

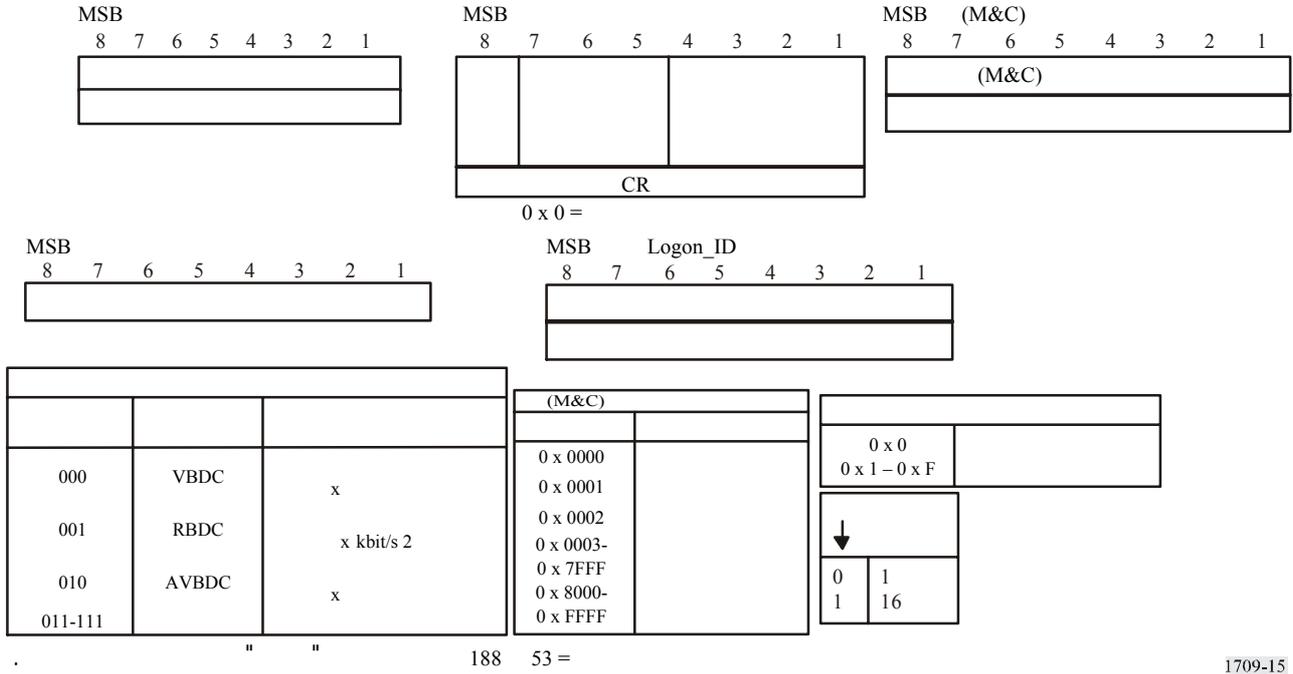
(SAC)

(MAC)

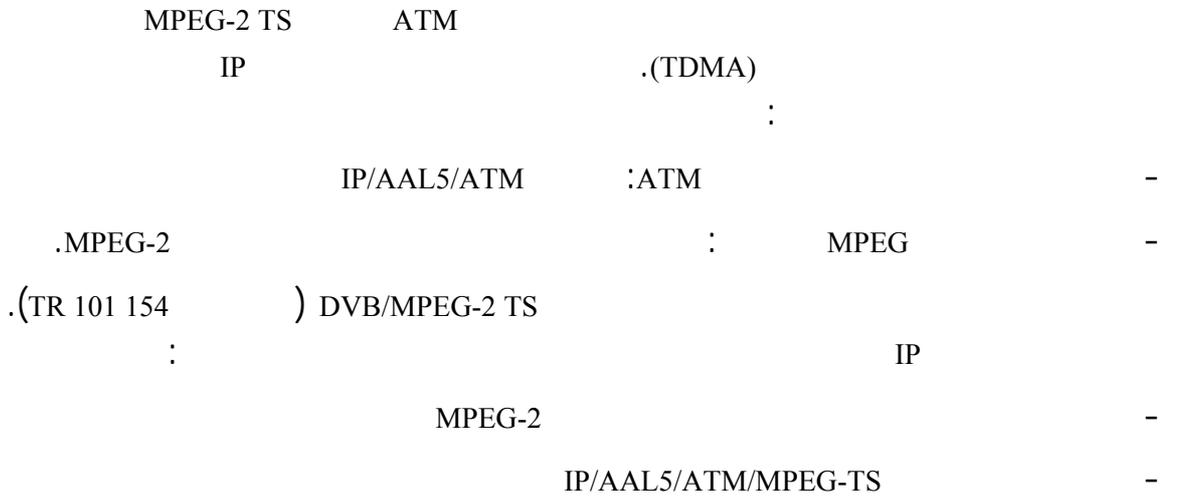
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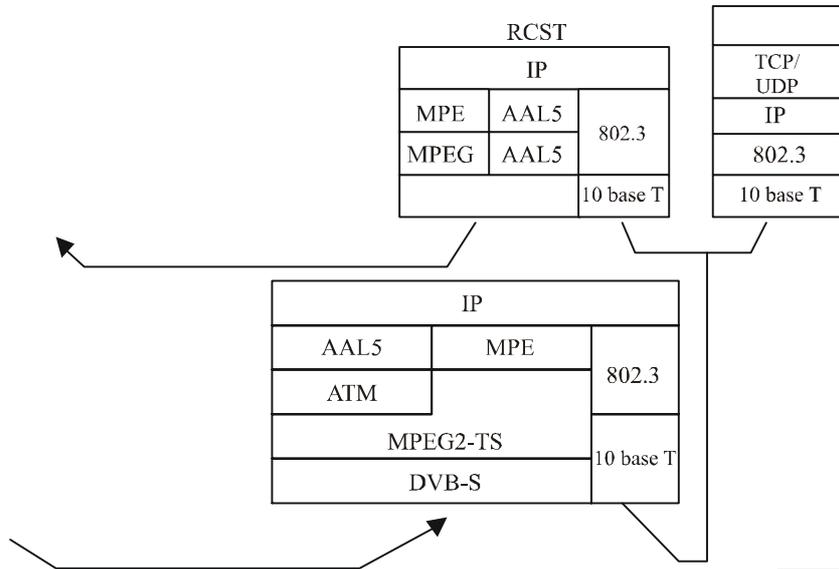
(SAC)



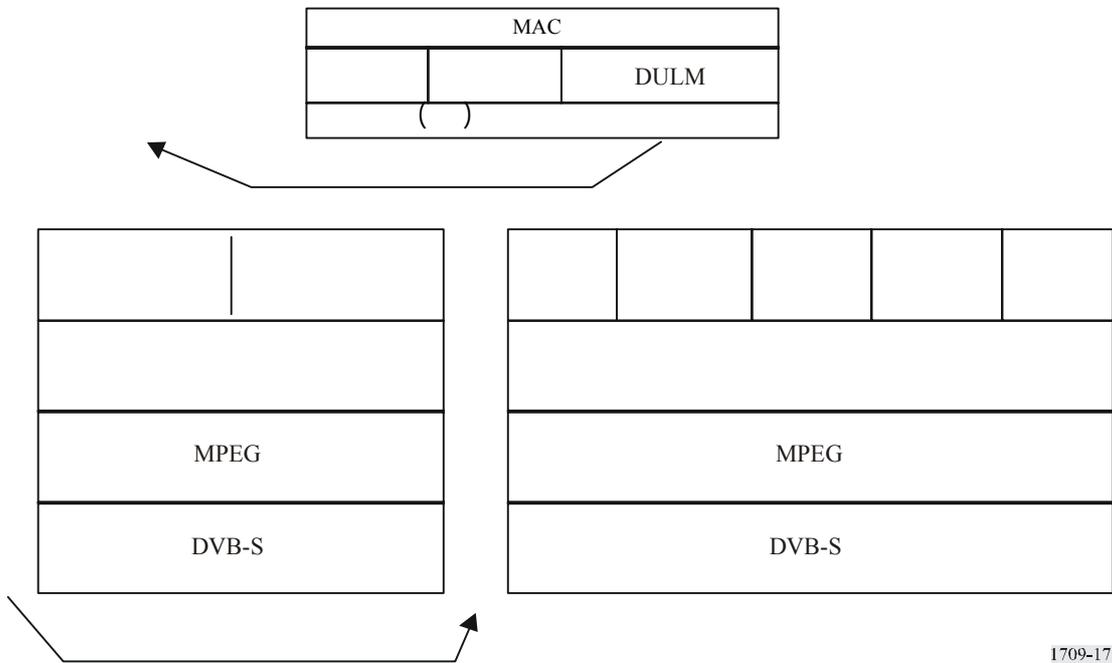
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A RCST
 (IP/AAL5/ATM/MPEG2/DVBS)



1709-16



1709-17

6

:

(CRA)

-

(RBDC)

-

(VBDC)

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(AVBDC)

-

(FCA)

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(CRA)

1.6

.NCC RCST

(RBDC)

2.6

(RBDC) .RCST RBDC
 RCST NCC RCST
 .NCC RBDC RCST

RBDC

NCC

) 15

RBDC

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RBDC

CRA

RBDC

CRA

(VBDC)

3.6

VBDC) .RCST VBDC
 RCST) NCC RCST
 .(RCST

(AVBDC)

4.6

VBDC) .RCST AVBDC
 RCST) NCC RCST
 RCST VBDC) AVBDC .(RCST
 .() VBDC

(FCA)

5.6

.NCC RCST RCST FCA
 .RCST FCA NCC

FCA

7

.(MF-TDMA)

.CSC

MF-TDMA

RCST

(MF-TDMA)

1.7

.(MF-TDMA)

RCST

RCST

NCC

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DVB

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IP

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DVB/MPEG-TS

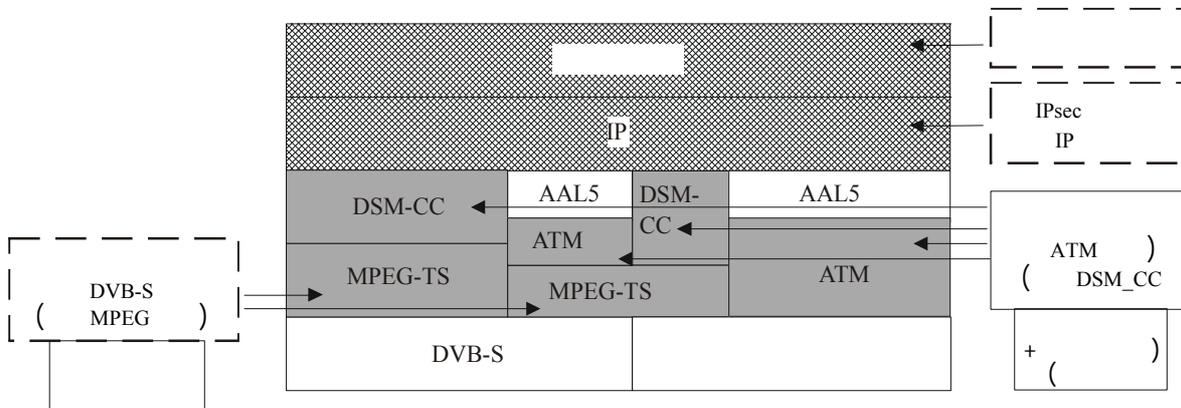
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DVB

18

18

()



ETSI BSM/RSM-A

31		1
31 RSM-A		2
31 RSM-A	1.2	
31 RSM-A	2.2	
32		3
34	1.3	
35	1.1.3	
35	2.1.3	
36	.....	3.1.3	
36	.....	4.1.3	
37	.....	5.1.3	
38	.....	2.3	
39	.....	1.2.3	
39	.....	2.2.3	
40	.....	3.2.3	
40	.....	4.2.3	
41	.....	3.3	
41		4
41 SLC	1.4	
41 (SMAC)	2.4	
42	3.4	
42 (CoS)	4.4	
44	5.4	
45	1.5.4	
45	2.5.4	
45	3.5.4	
45 Aloha	4.5.4	
45 -		5

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(ETSI)

.(102 189-1~3 ETSI TS 102 188-1~7) SES/BSM RSM-A

RSM-A

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RSM-A

1.2

) SES/BSM RSM-A

(ETSI)

.(102 189-1~3 ETSI TS 102 188-1~7

.(ETSI TS 102 292) ETSI SES/BSM (SI-SAP)

RSM-A

FDMA-TDMA

TDM

MAC
TDM

RSM-A

2.2

(ETSI TS 102 292) ETSI/BSM

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IP

(PEP))

.(ETSI TS 102 292) (SI-SAP)

OSI

SI-SAP

.(ST-to-ST)

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RSM-A

ST

SI-SAP

.(PHY)

(SMAC)

(SLC)

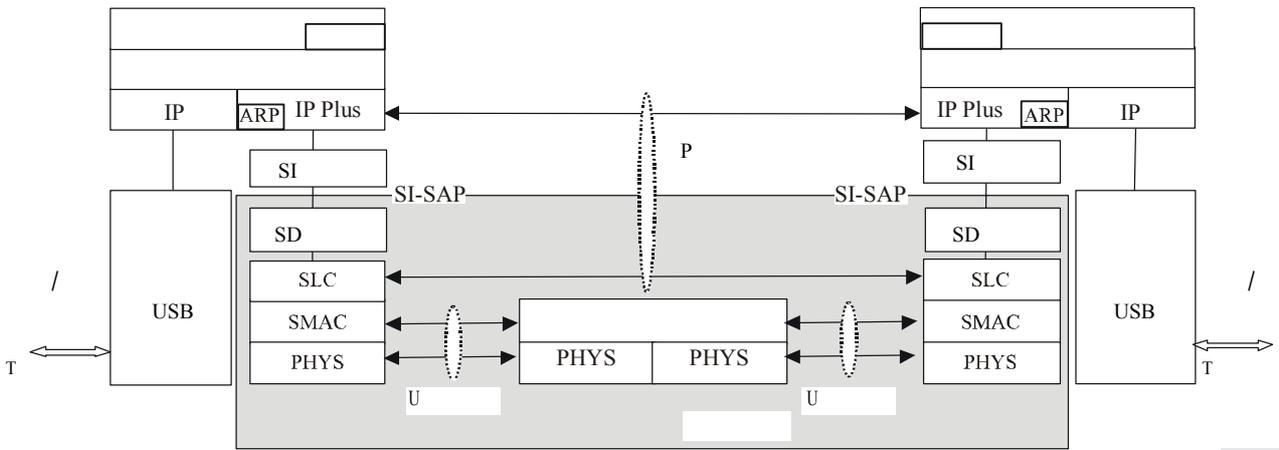
(BoD)

MAC

.MAC

MAC

RSM-A



1709-19

) BSM RSM-A

(PHY)

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(ETSI TS 102 188-1~7

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RSM-A

.(SMAC)

(SLC)

(ETSI TS 102 189-1~3

) BSM RSM-A SLC/SMAC

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(SAM)

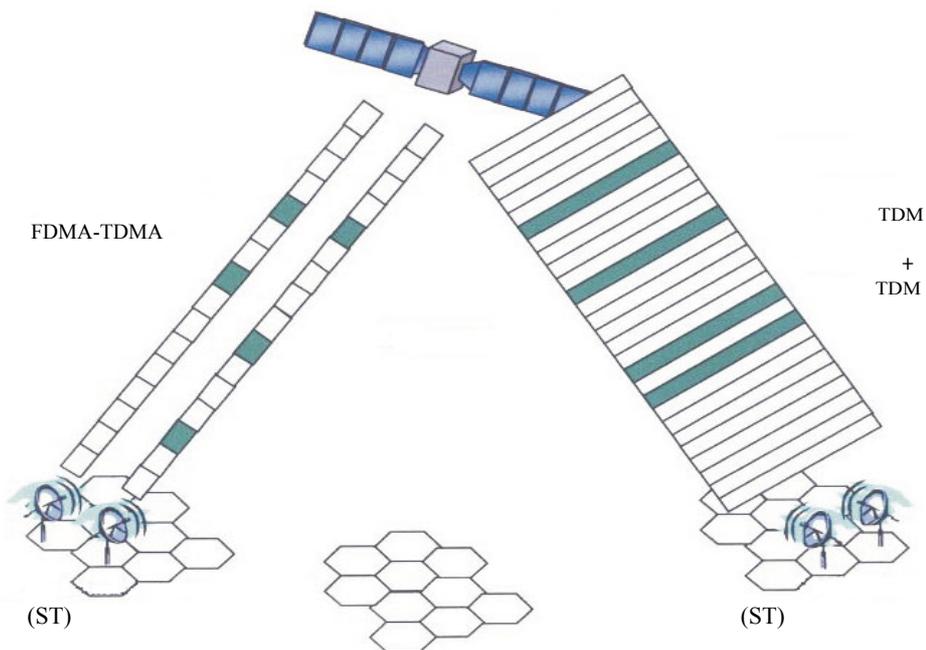
RSM-A

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SAM

ST

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1709-20

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.(FDMA-TDMA)

FDMA-TDMA

.Mbit/s 16 kbit/s 128

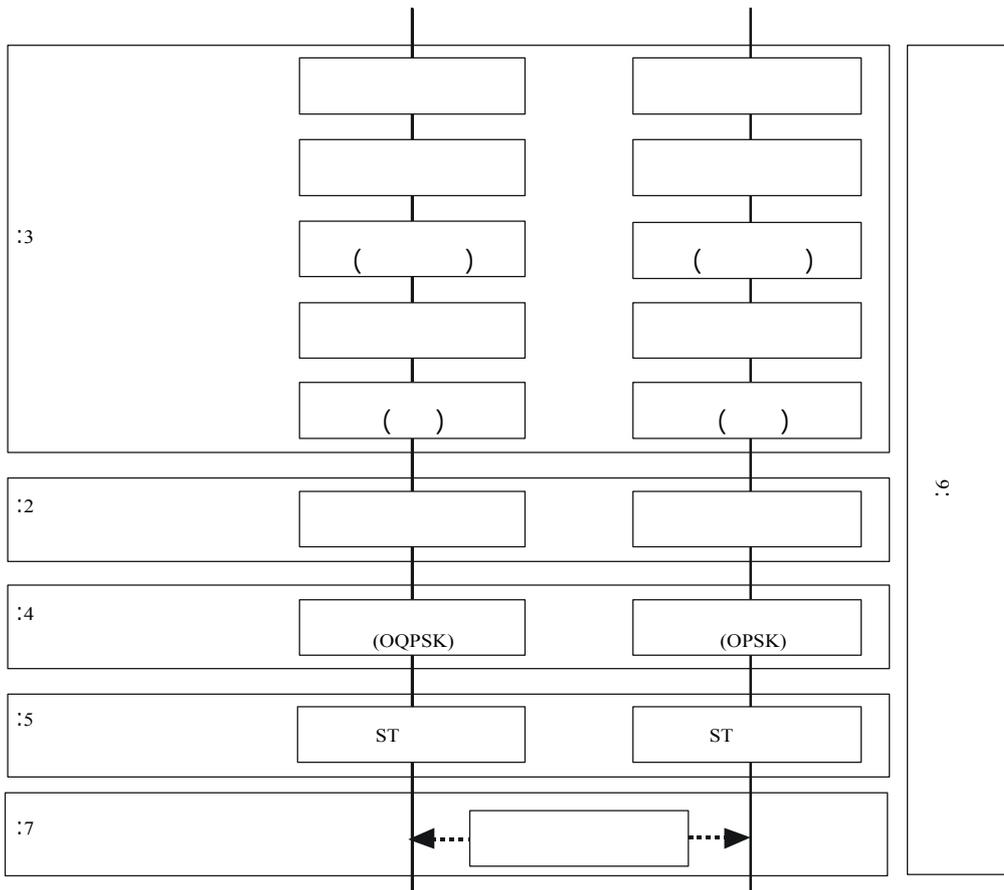
.(TDM)

TDM

TDM

21

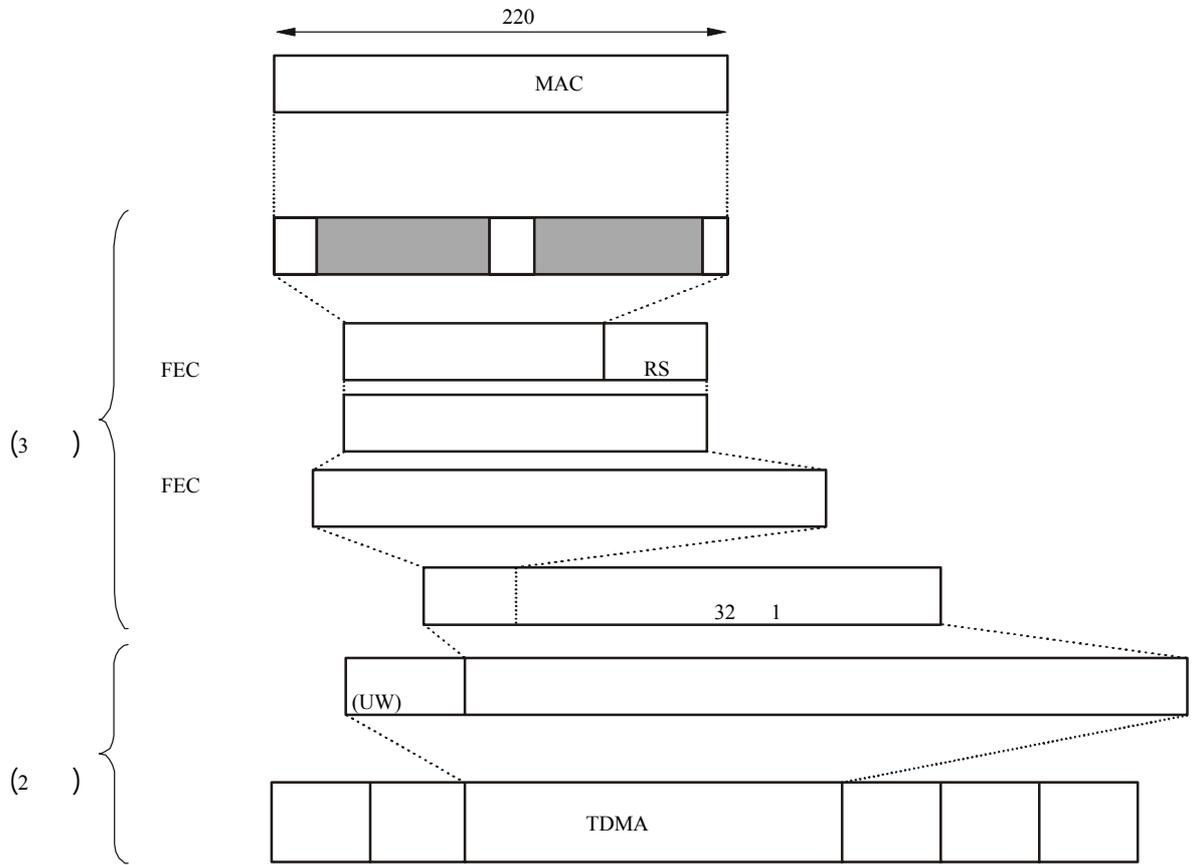
21



1709-21

:QPSK
:OQPSK

22



RSM-A

MAC

SMAC

TDMA

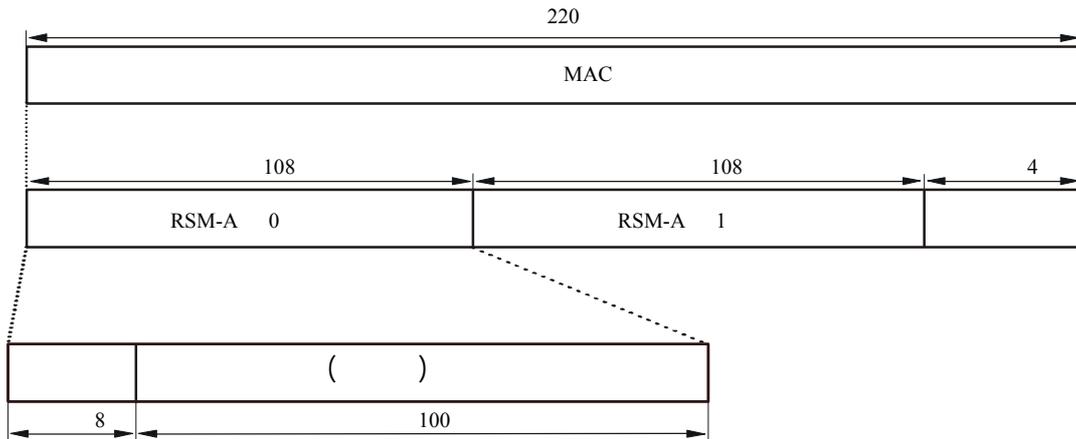
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) FEC

MAC

23

MAC



1709-23

) 3 MAC

.(ETSI TS 102 188-1~7

1.1.3

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MAC

RS (244,220)

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.(12,8)

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.(ETSI TS 102 188-1~7

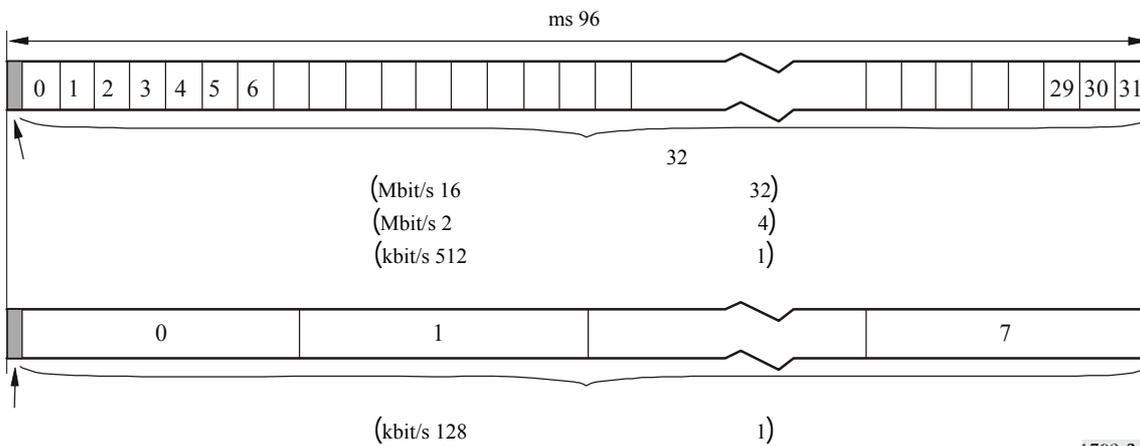
2.1.3

.Mbit/s 16 Mbit/s 2 kbit/s 512 kbit/s 128 : FDMA

.24

TDMA

24



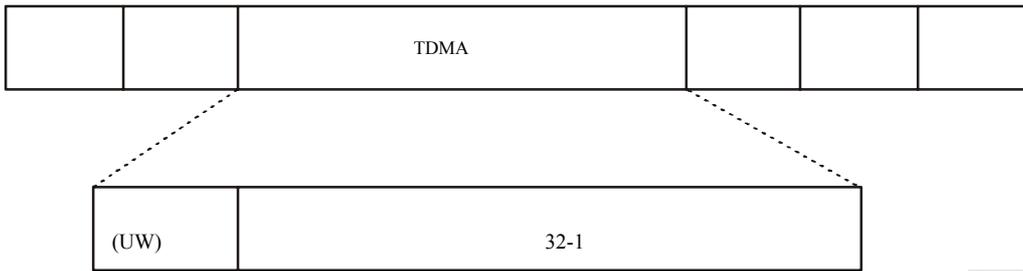
1709-24

Mbit/s 2 Mbit/s 16 : TDMA
 32 -
 .kbit/s 512 -
 .kbit/s 128 8 -
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 (ETSI TS 102 189 1~3

: FDMA TDMA FDMA-TDMA
 .Mbit/s 16 kbit/s 128
 .() ()
 .25 TDMA

25

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1709-25

32 1 (UW) TDMA

.(ETSI TS 102 188-1~7) 2

3.1.3

).(OQPSK) 4)

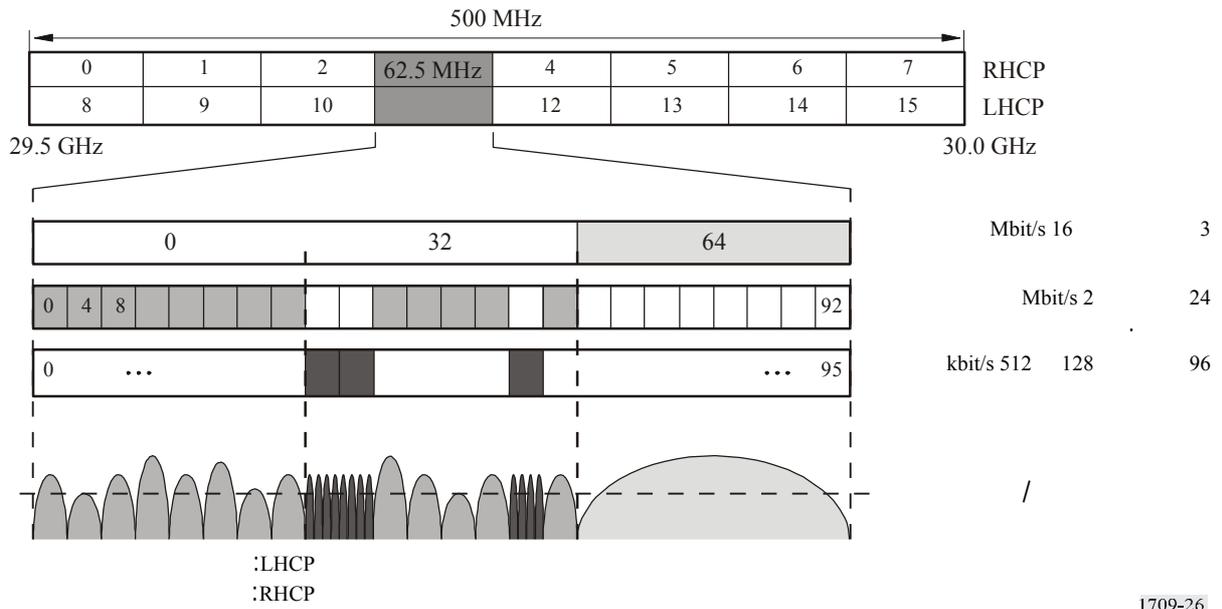
.(ETSI TS 102 188-1~7

4.1.3

8 MHz 62,5 16 MHz 500

kbit/s 128

26 .Mbit/s 16 Mbit/s 2 kbit/s 512



1709-26

kbit/s 512 kbit/s 128
 96 MHz 62.5 .Hz 651 041²/₃
 . 95 2 1 0 kbit/s 512 kbit/s 128 .
 .Hz 2 604 166²/₃ Mbit/s 2
 0 Mbit/s 2 24 MHz 62,5
 . .Hz 20 833 333¹/₃ Mbit/s 16
 Mbit/s 16 . MHz 62,5
 . . 64 32 0

5.1.3

(ULPC)

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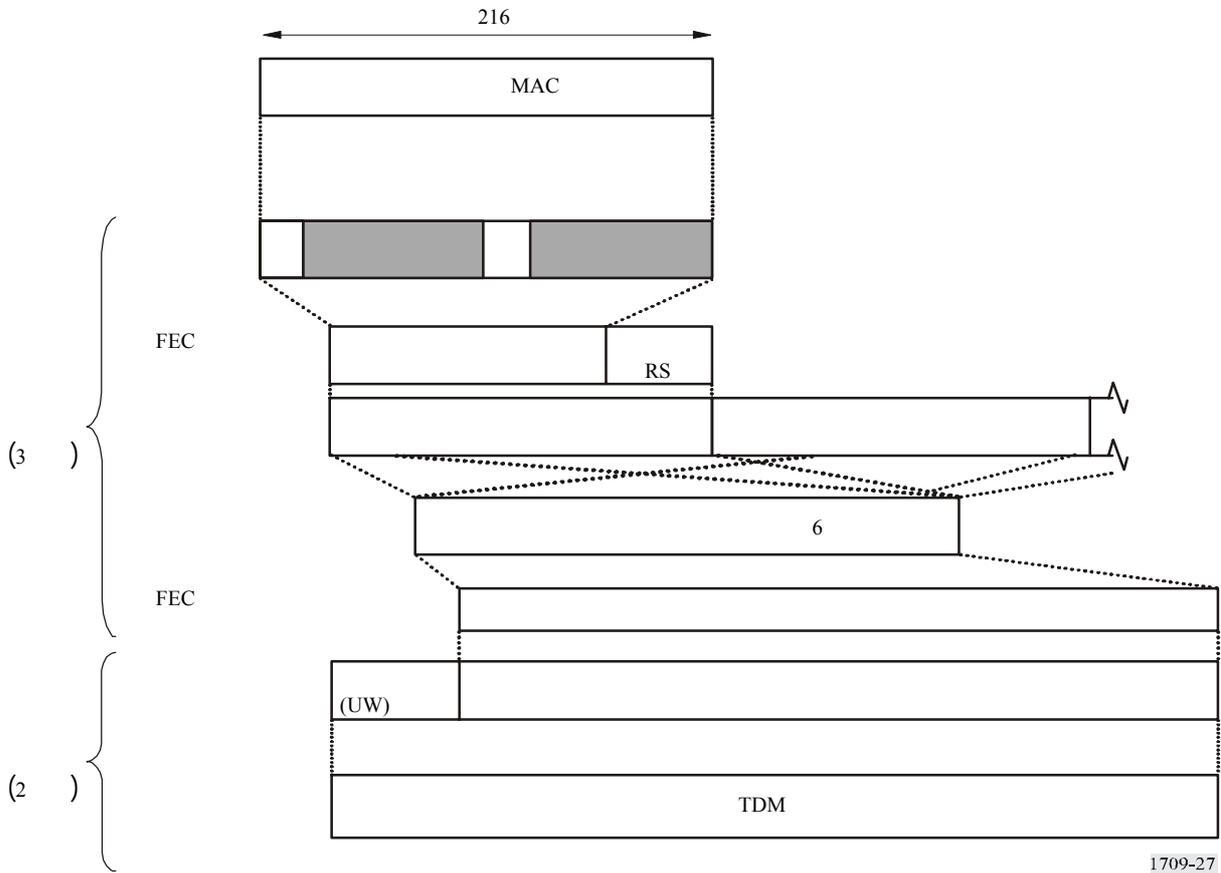
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ULPC

(ETSI TS 102 188-1~7)

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27



1709-27

MAC

(SMAC)

MAC .RSM-A

() FEC

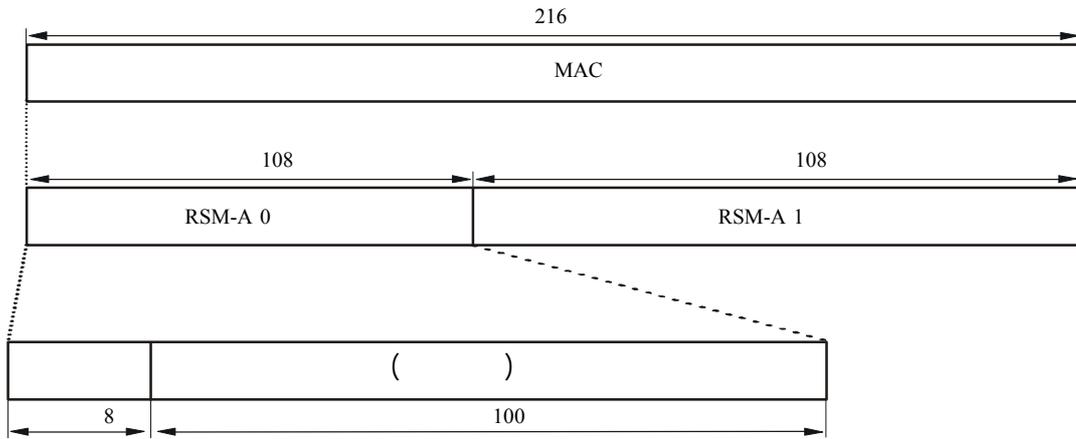
TDM

.28

MAC

28

MAC



1709-28

) 3 MAC

.(ETSI TS 102 188-1~7

1.2.3

: MAC
) MAC

(RS 236,216

.2/3

6 354) 2 838

4 257

.(ETSI TS 102 188-1~7

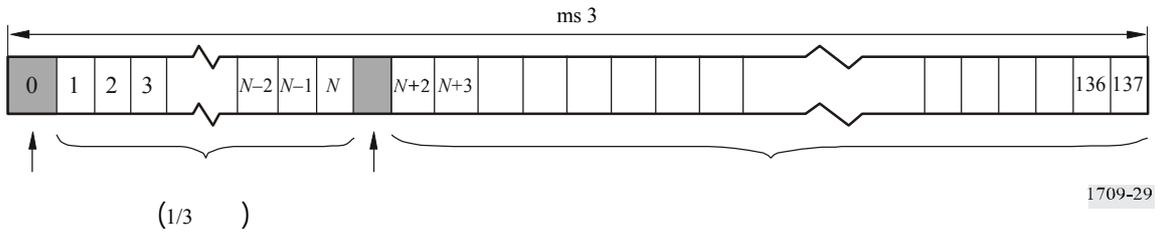
3

2.2.3

.29

0,768

.(1/4 1/3)



1/3
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: . (1/4 1/3

136 1	45 0	1/3
136 0	34 0	1/4

.(ETSI TS 102 188-1~7) 2

.(ETSI TS 102 189-1~3) RSM-A SMAC/SLC

3.2.3

4 (QPSK)

.(ETSI TS 102 188 1~7)

4.2.3

	:		1/4 1/3	
.(BPSK)	QPSK	${}^610 \times 133\frac{1}{3}$	- 1/3	-
		${}^610 \times 133\frac{1}{3}$	Q I	
.(BPSK)	QPSK	${}^610 \times 100$	- 1/4	-
	.(BPSK)	${}^610 \times 100$	Q I	
.(BPSK)	QPSK	${}^610 \times 400$	-	-
	.(BPSK)	${}^610 \times 400$	Q I	

:

.(ETSI TS 102 188-1~7) 5

6

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.() 7
.(ETSI TS 102 188-1~7)

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-
4

(SLC)

.(SMAC)

SLC

1.4

: SLC

/

CRC

.(SDU)

(EDU)

SLC

EDU

.EDU

SLC

.(SLC-PDU)

(SMAC)

2.4

: SMAC

.(UDC)

SDU

(UDTS)

.(PDS)

MAC

RSM-A

.SLC-PDU

-
-
-
-
-
-
-
-

	(CoS)			-
				-
	RSM-A		.PDS	
	RSM-A		PDS	
				-
			RSM-A	-
	(ACF)		(SAM)	-
		.U	MAC	
		RSM-A		-
/	MGID	MGID	(MGID)	
(		NOCC		
			MGID	
				3.4
:		SMAC		
		(HVUL)		
			(BoD)	
			BoD	
	Aloha	Aloha		
			" "	
		HVUL		
		" "		
			.NOCC	
			(CoS)	4.4
			(QoS)	
	(ETSI TS 102 295	) BSM		
	(QoS)			(CoS)
ITU-T Y. 1541		BSM		
				.3

(UDTS) RSM-A
 UDTS PDS (PDS) RSM-A
 BSM 3
 RSM-A UDTS (ETSI TS 102 295)

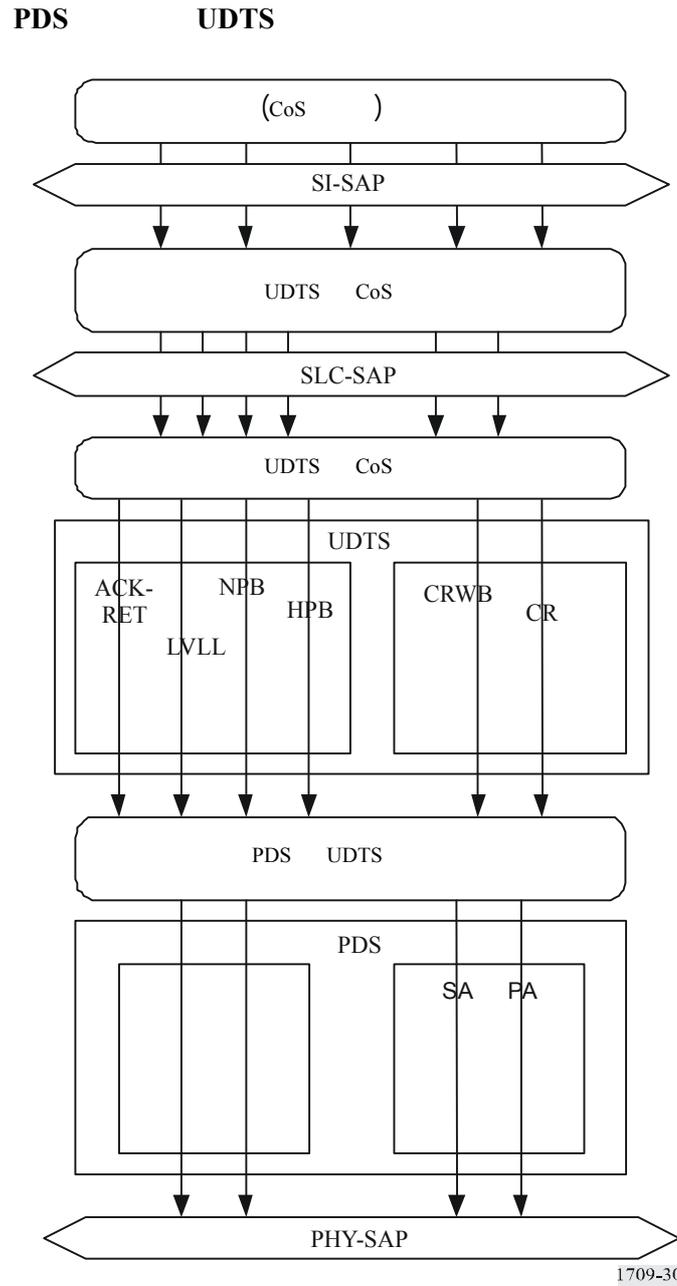
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RSM-A UDTS BSM

RSM-A	(ETSI TS 102 295) BSM		
UDTS ⁽¹⁾	Y.1541		
	N/A		0
CR	0	- (VoIP)	1
CRWB	1) - (2
LVLL	2	(PEP)	3
HPB	3	PEP	4
NPB	4	) (	5
NPB	5	) (IP	6
NPB	N/A	/ ()	7

) SMAC/SLC 2 RSM-A UDTS (1)
 (ETSI TS 102 189-1~3
 .ITU-T Y.1541 "7" "0" BSM -

.BoD 30
) SMAC/SLC 2 PDS UDTS
 (ETSI TS 102 189- 1~3



1709-30

(PTO) SLC

PDS UDTs

SMAC SMAC PDS

SMAC PTO PTO PTO

.PTO

1.5.4

NOCC

2.5.4

UDC

.SMAC

SLC

3.5.4

SMAC

.(ETSI TS 102 189-1~3

) SMAC/SLC

2

Aloha

4.5.4

Aloha

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Aloha

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.TCP

SMAC/SLC

2

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/

Aloha

.(ETSI TS 102 189-1~3

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5

(SAM)

RSM-A

SAM

SAM

3

NOCC

.(ETSI TS 102 189-1~3

) SMAC/SLC

: RSM-A

SAM

-
-
-
-

(ST)

SAM

