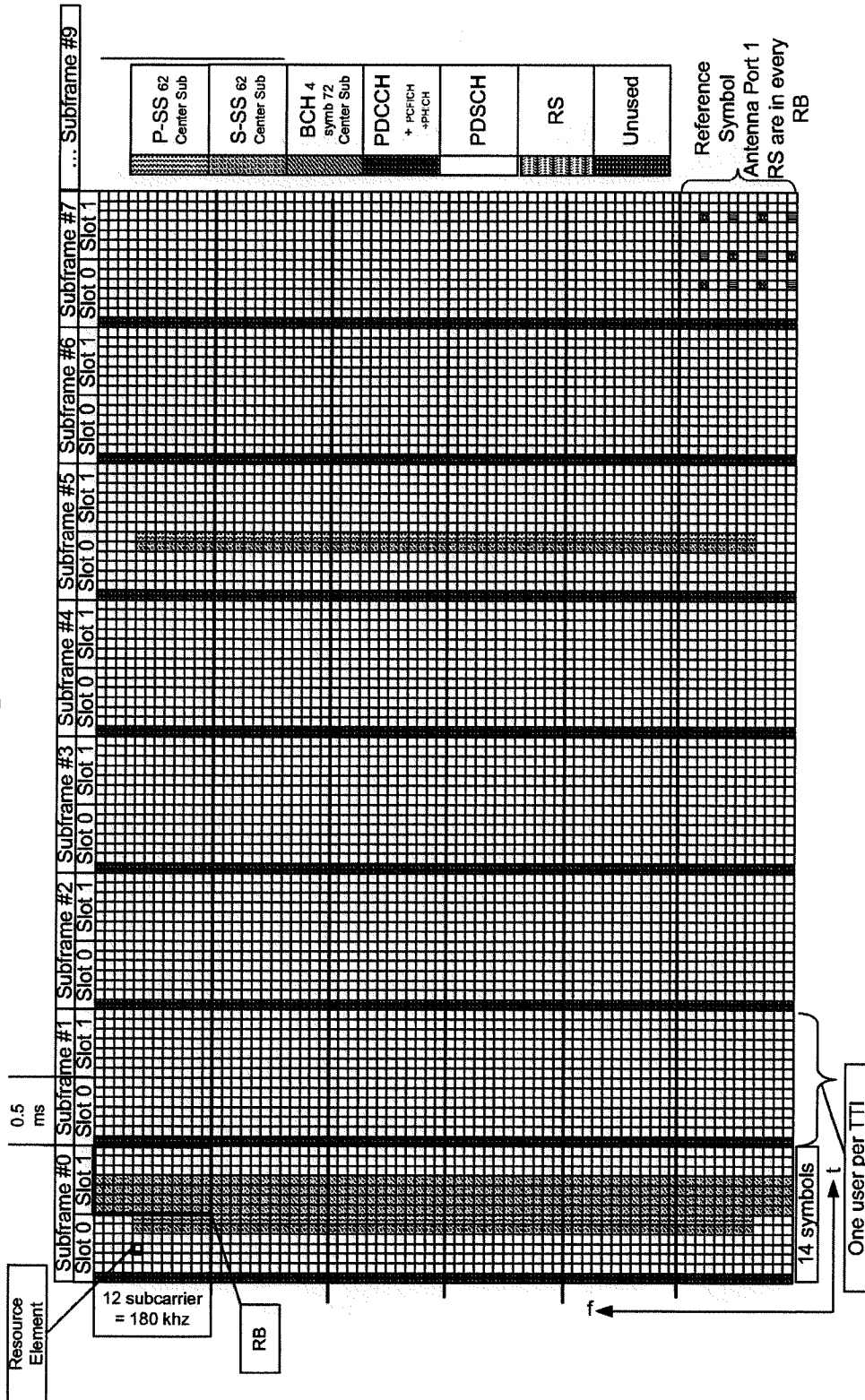


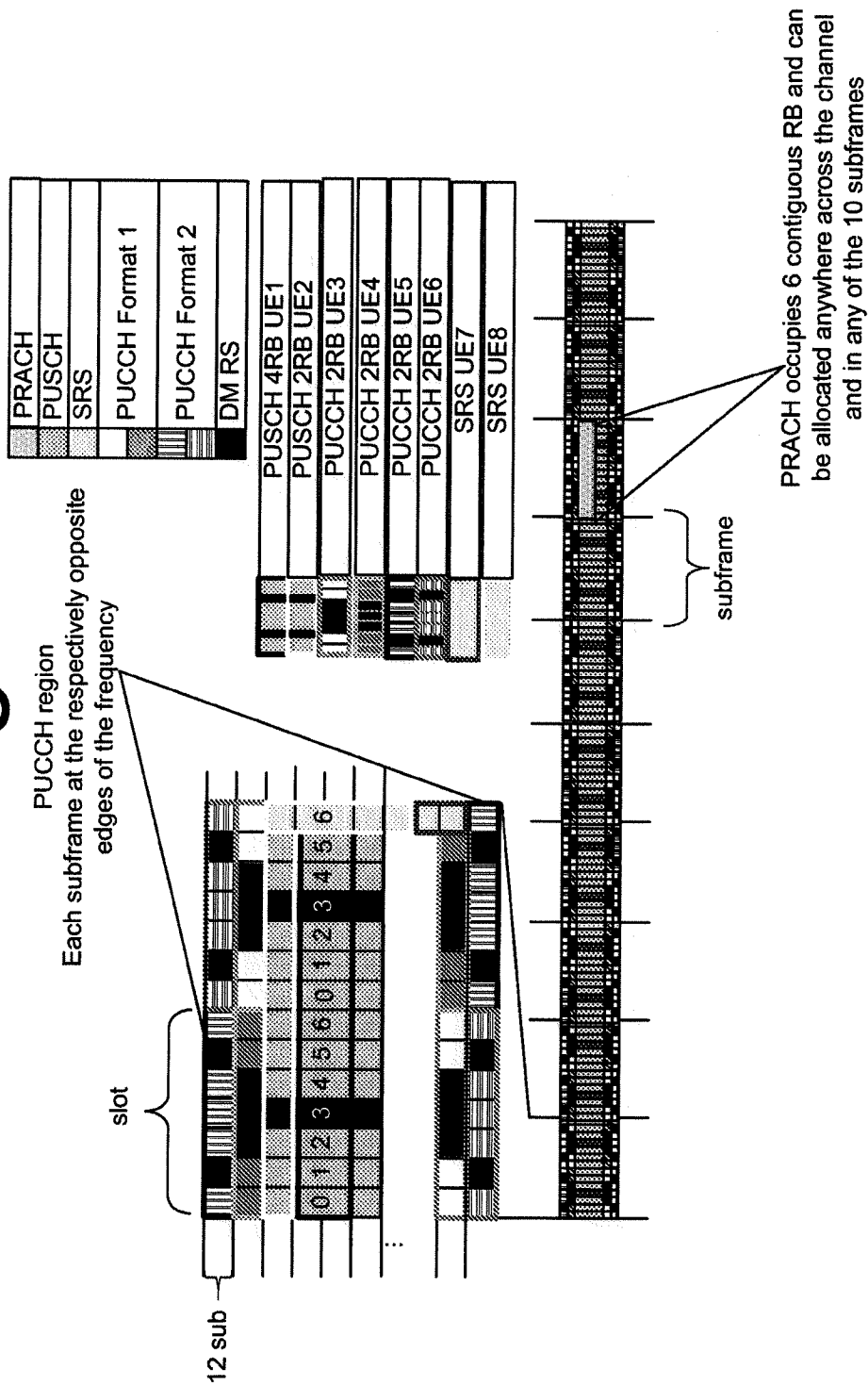
Prior Art

Fig. 1



Prior Art

Fig. 2



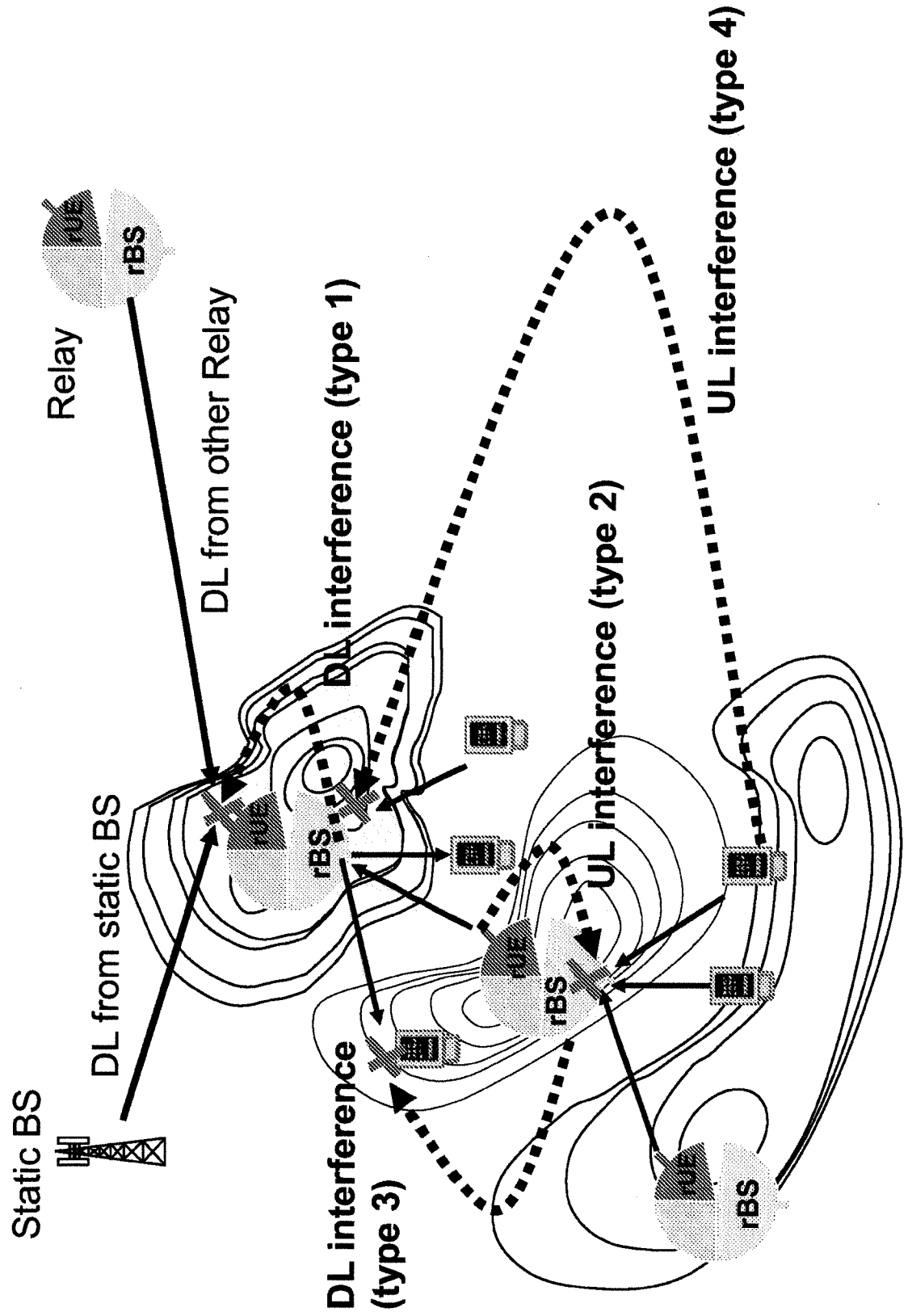
Channel BW	1.4	3	5	10	15	20
Allocated RB	6	15	25	50	75	100

Fig. 3

Radio link	Channel type	Channel	Physical Channel	Purpose
Uplink	TrCh (between MAC and Phy)	UL-SCH	PUSCH	Carries user UL data
		RACH	PRACH	UE establish connection
	Control Information	UCI (Uplink Control Information)	PUSCH	Scheduling request, HARQ, CQI
			PUCCH	
Downlink	TrCh	DL-SCH	PD SCH	Carries user UL data / RRC
		BCH	PB SCH	MIB
		PCH	PD SCH	Paging
		MCH	PMCH	Multicast
	Control Information	CFI (Control Format Indicator)	PCFICH	Number of symbols are used for PDCCH in a subfr
		HI(HARQ Indicator)	PHICH	Ack/Nack feedback to the UE for the uplink blocks
		DCI (Downlink Control Information)	PDCCH	PUSCH grant, PDSCH assignment,
			P-SS S-SS	Synchronization
			RS	Channel estimation

Prior Art

Fig. 4



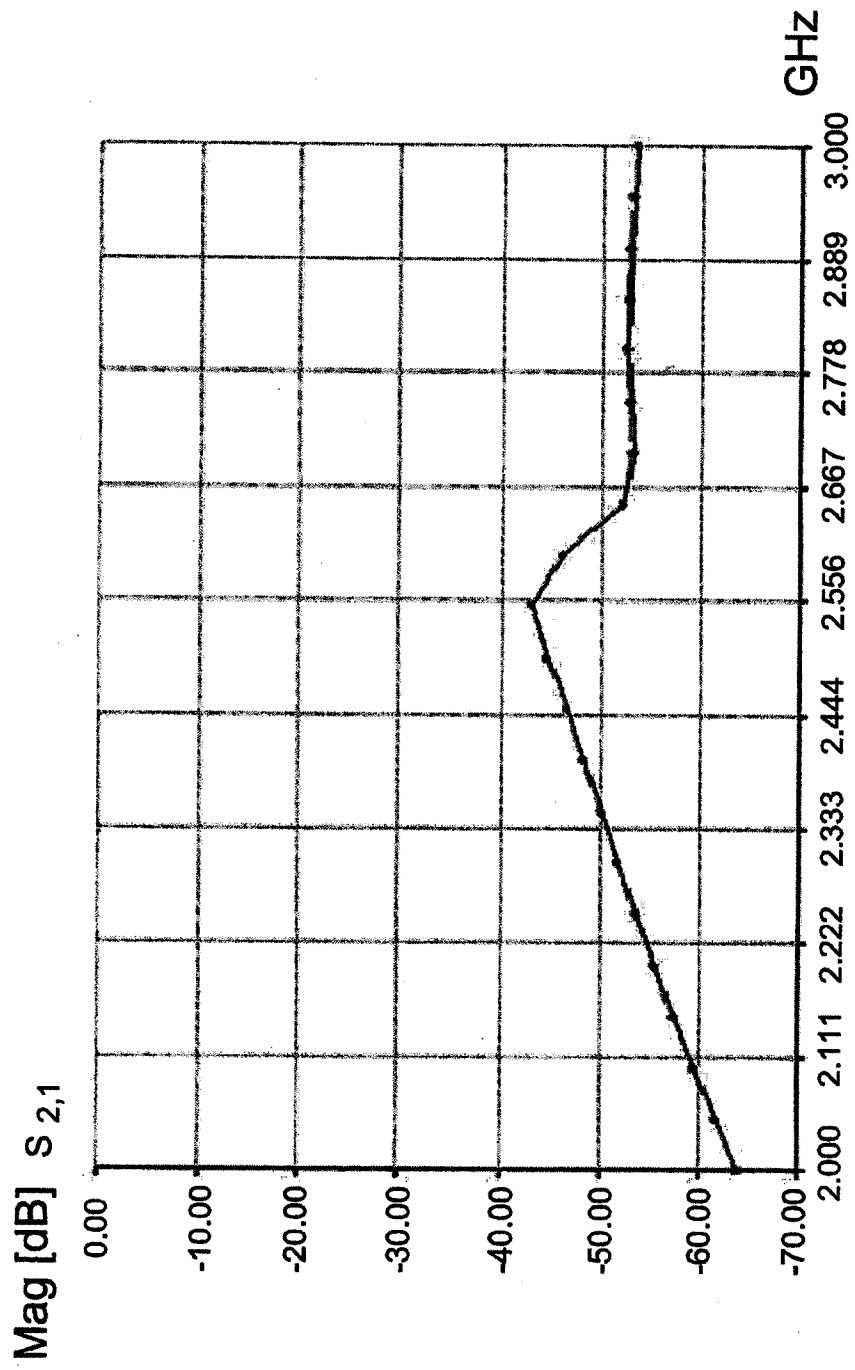


Fig. 5

Fig. 6a

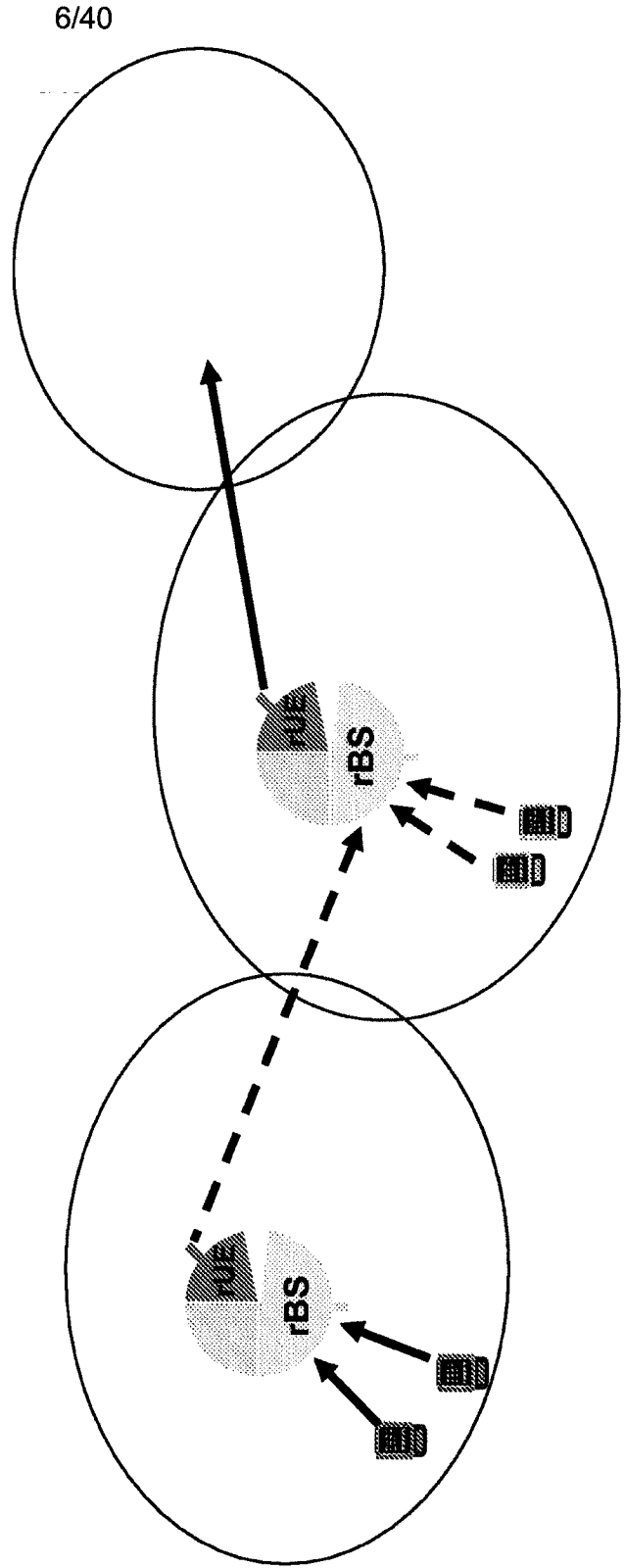
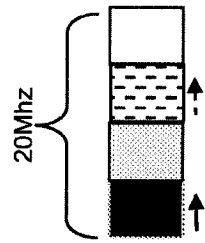


Fig. 6b

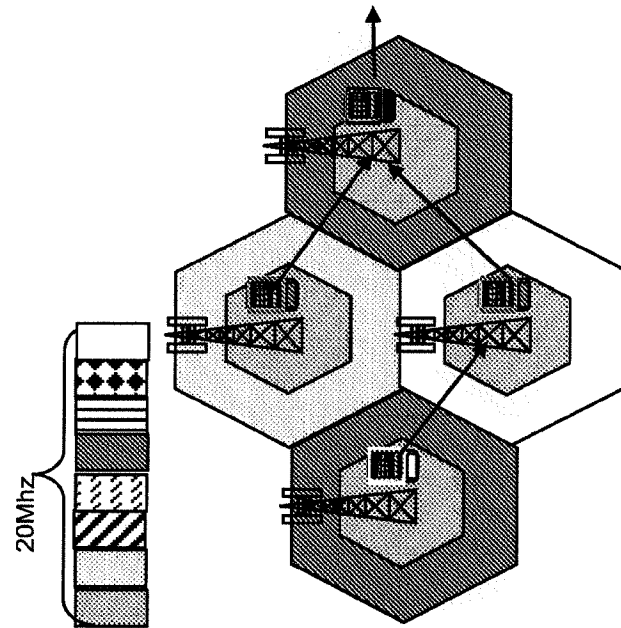


Fig. 7a: prior art

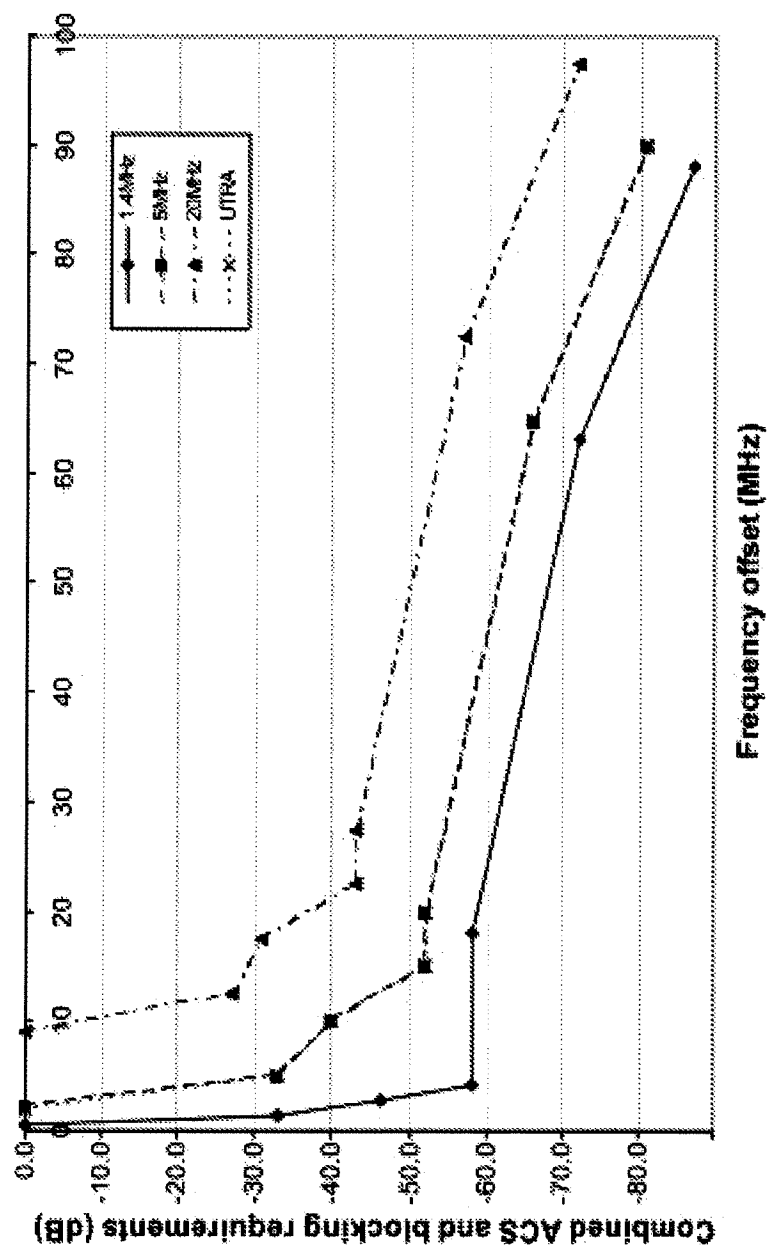
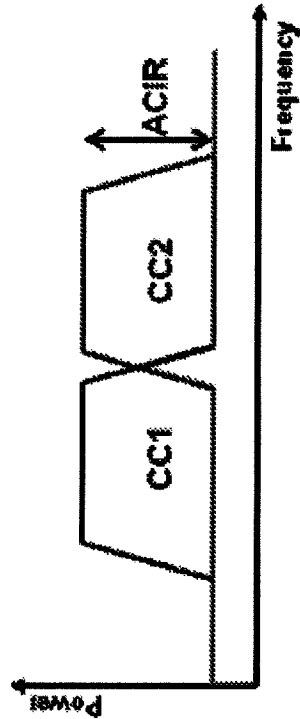


Fig. 7b

Prior Art



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Figure 4-10: Inter-carrier interference coupling mechanism.

The 3GPP specifications define separate sets of values for the above parameters for base stations and user equipments. A summary of the values is given in Table 4-3.

Table 4-3: Transmitting and receiving imperfection limits defined by 3GPP.

	ACLR	ACS
Base station [3GPP36104]	45 dB	46 dB
User equipment [3GPP36101]	30 dB	33 dB

Fig. 8: prior art

Table 4-4: Typical radio conditions on RN backhaul links without the loop interference.

	Received backhaul link signal power (S)	Backhaul link signal quality (SINR ₀)
3GPP Case 1 (ISD = 500 m)	-44 dBm ¹⁾	16 dB ¹⁾
3GPP Case 3 (ISD = 1732 m)	-64 dBm ¹⁾	16 dB ¹⁾

¹⁾ Based on system level simulations done according to the 3GPP defined and ARTIST4G WP5 accepted simulation assumptions [3GPP36814][ARTD51]

By substituting the parameters in equation (4.10) with the values from Table 4-4, $P_{RN} = 13 \text{ dBm/PRB}$ and $ACIR = 42.5 \text{ dB}$, the calculated RN backhaul link signal quality degradation as a function of RN antenna isolation is as depicted in Figure 4-12.

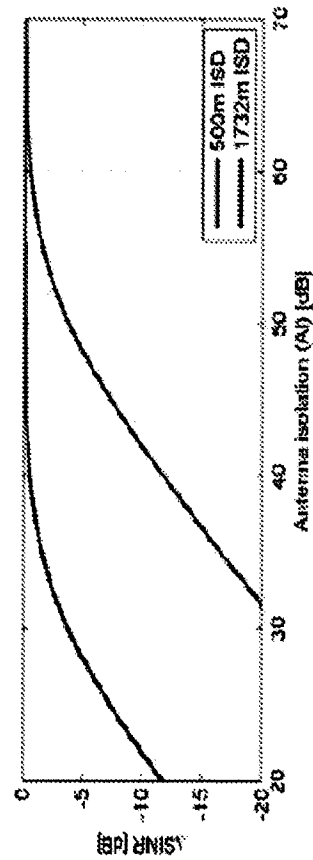


Figure 4-12: Out-band RN backhaul link signal quality degradation caused by inter-carrier loop interference.

Fig. 9

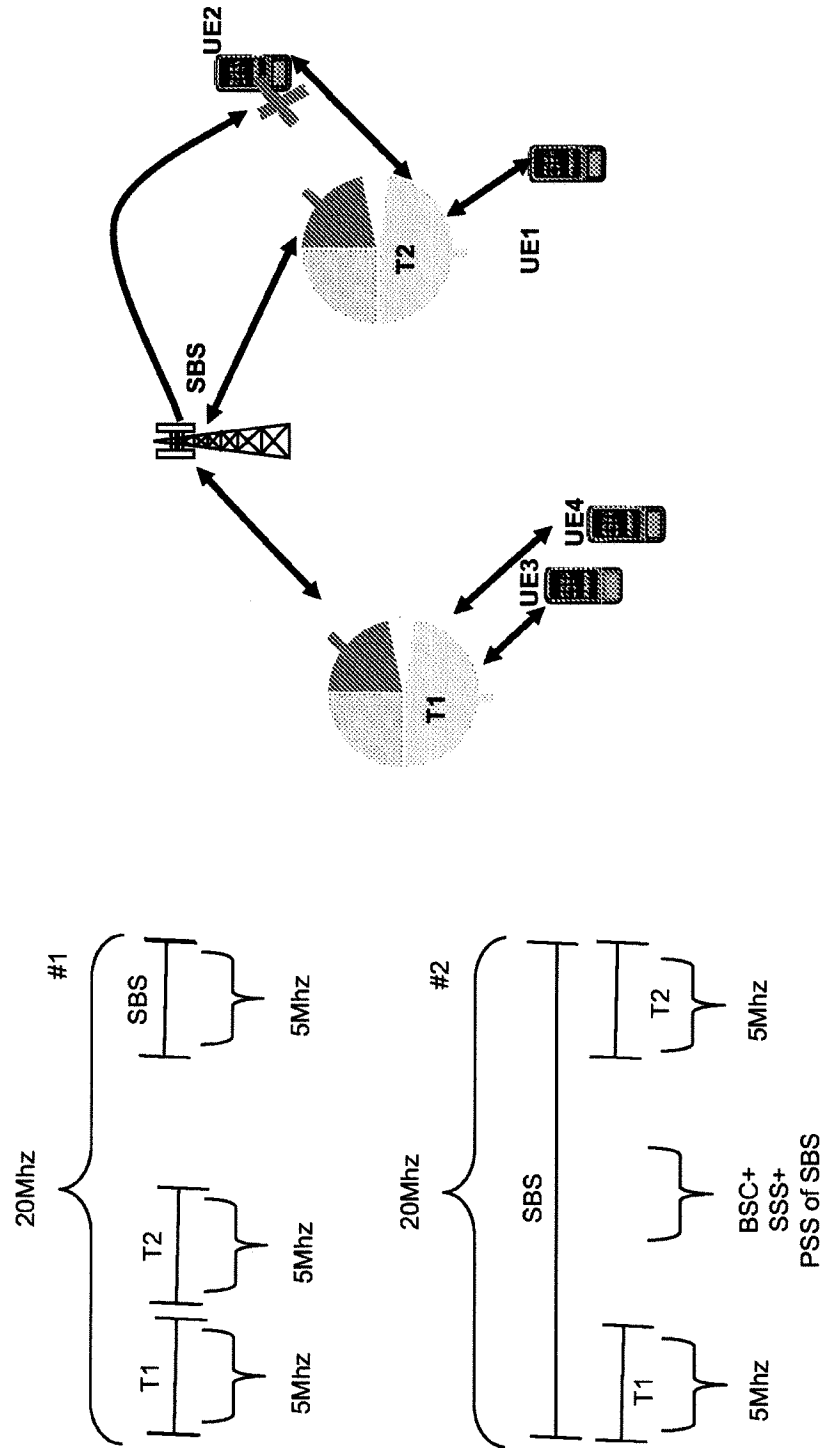


Fig. 10a

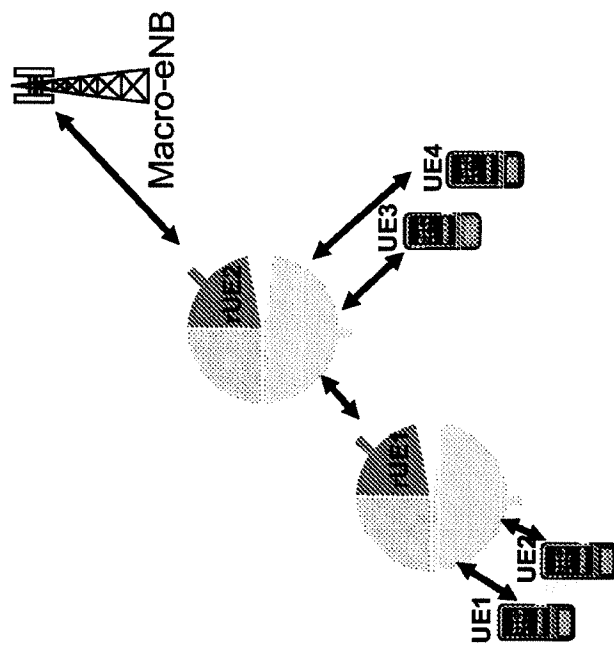
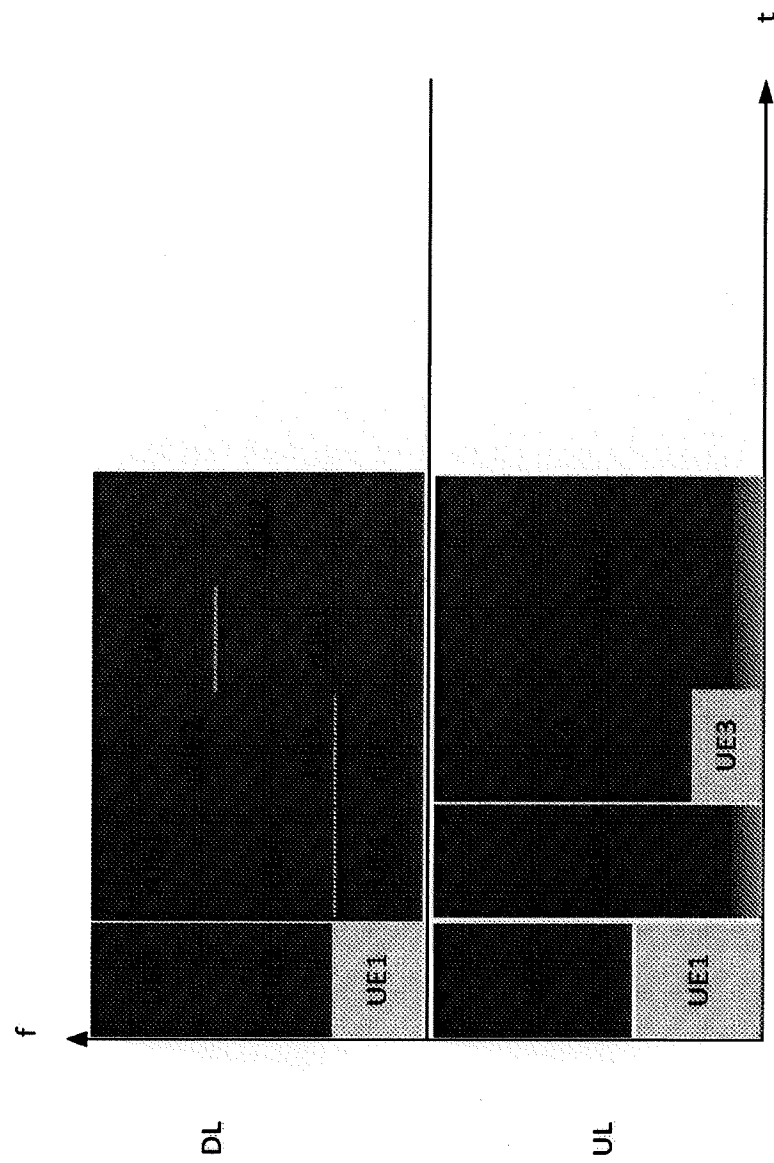


Fig. 10b



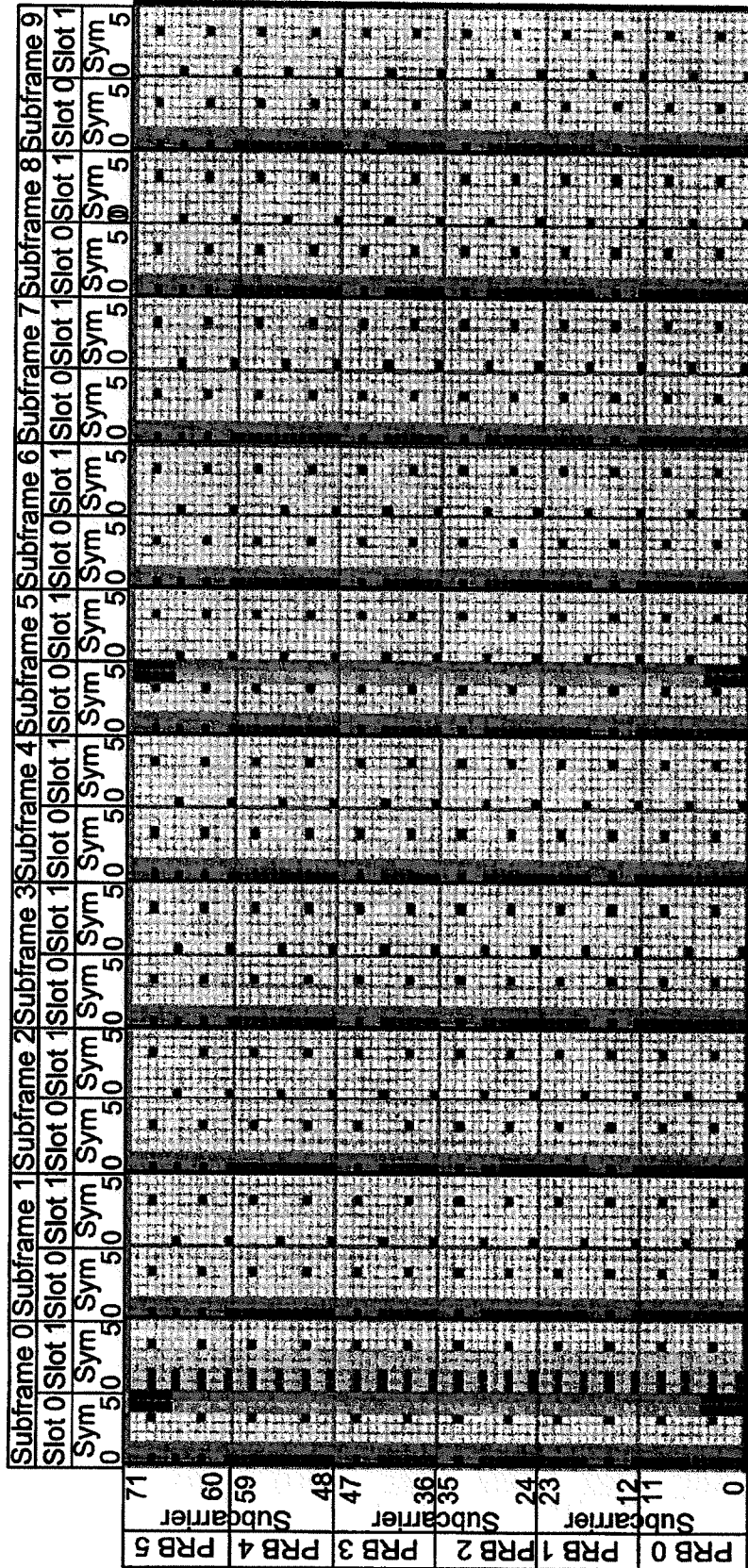


Fig. 12 Prior Art

Fig. 13a

SBS

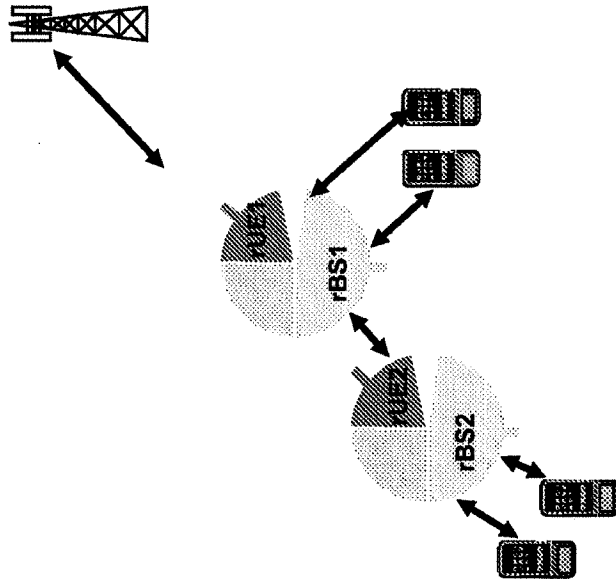
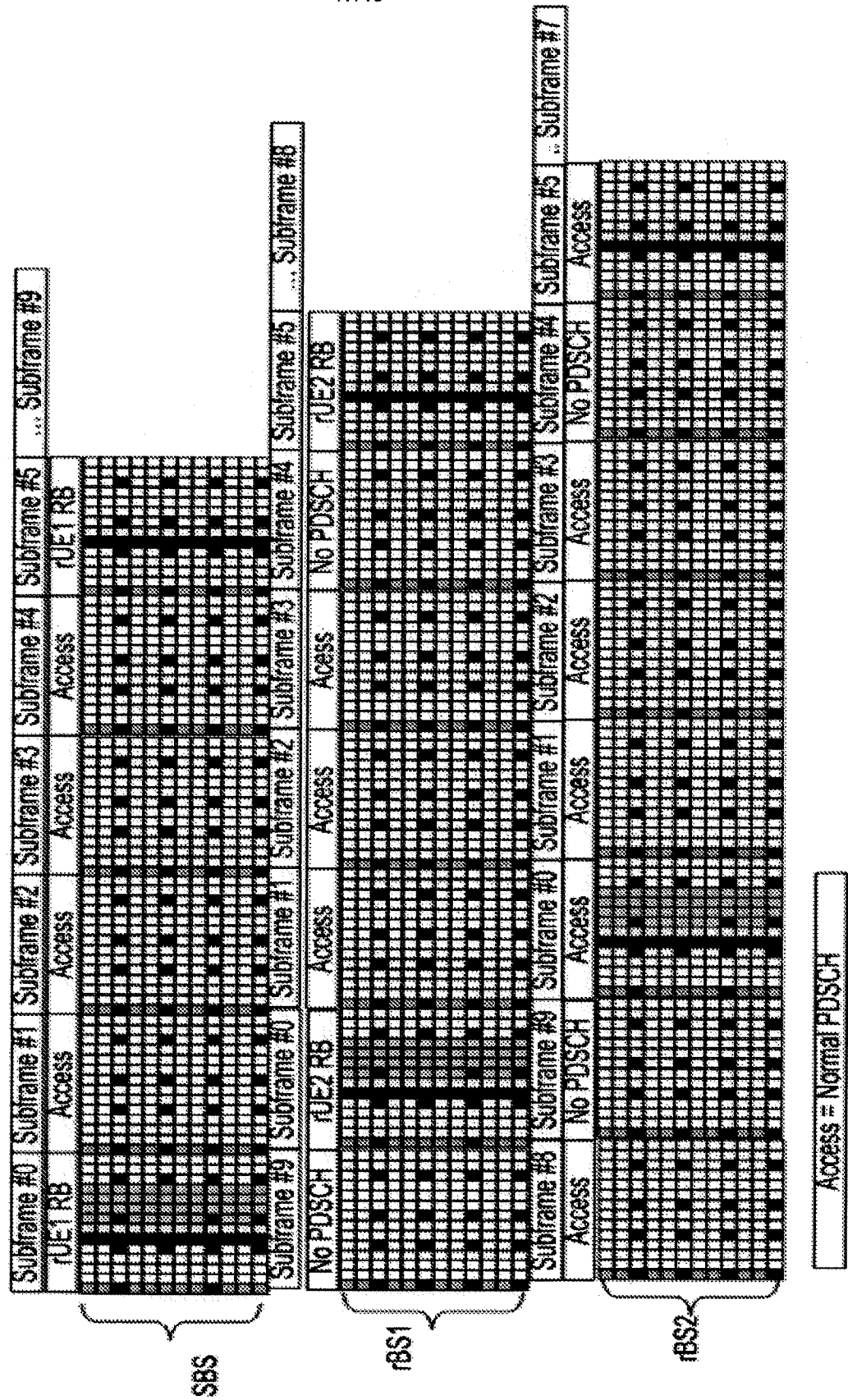
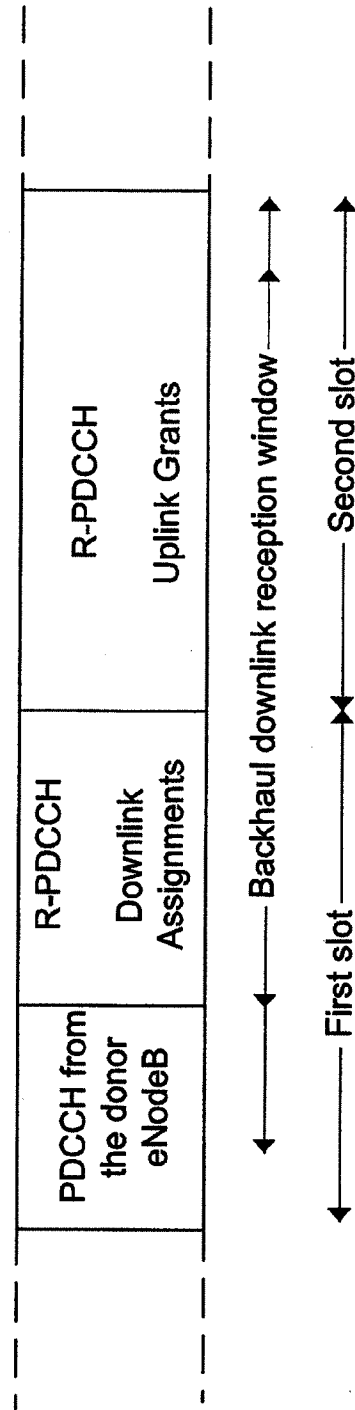


Fig. 13b



**Fig. 14**

Prior Art

Fig. 15

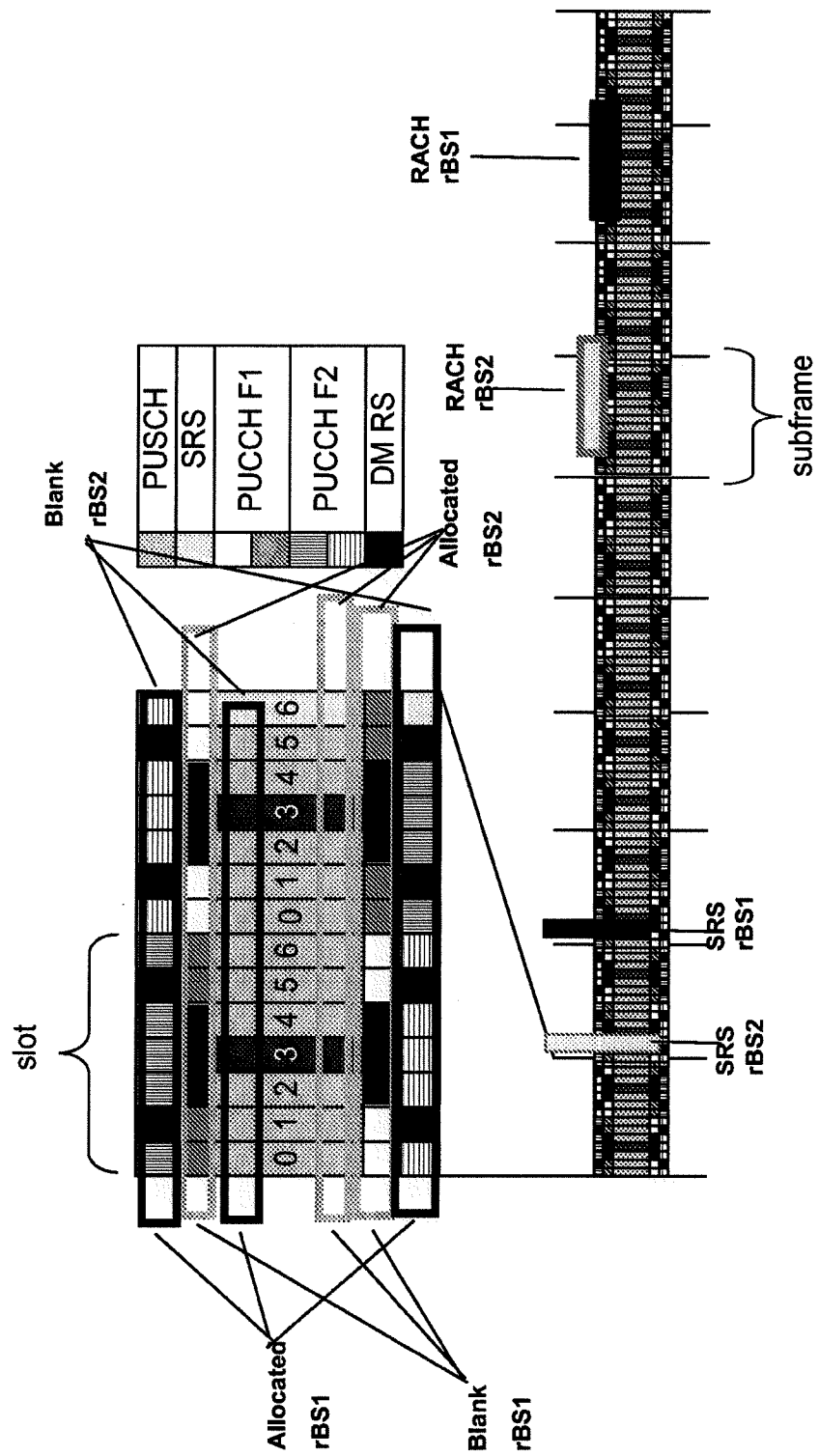


Fig. 16

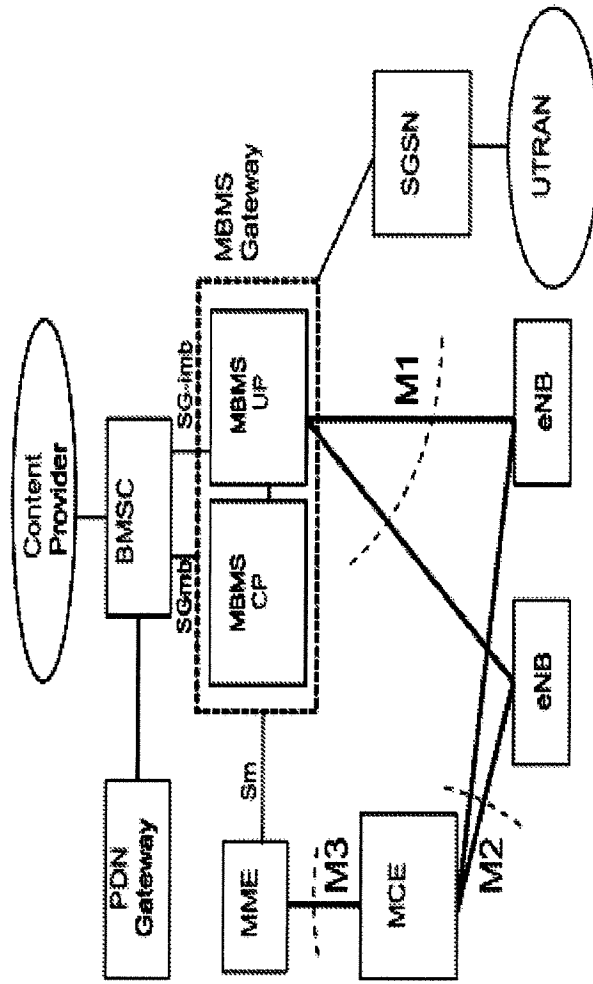


Figure 13.2: EPS reference architecture for MBMS broadcast mode [1].
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Prior Art

Fig. 17

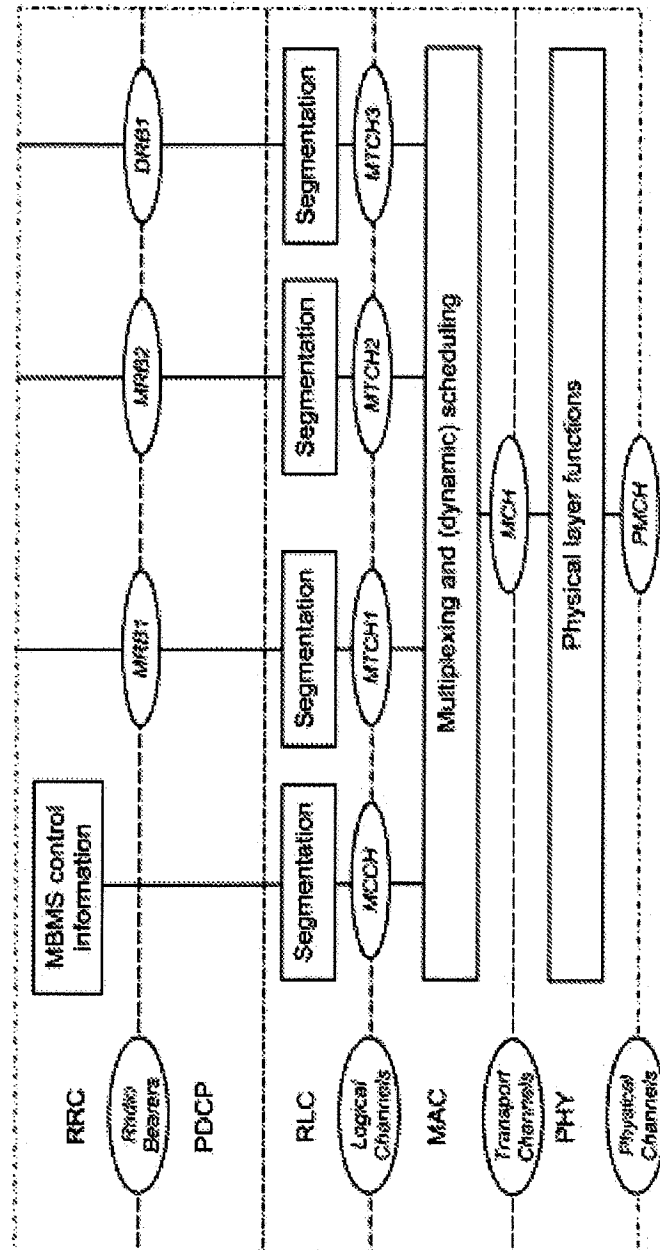


Figure 13.8: LTE protocol extensions to support MBMS.

Prior Art

Fig. 18

FDD	0	1	2	3	4	5	6	7	8	9
	X	MBSFN Enabled	MBSFN Enabled	MBSFN Enabled	X	X	MBSFN Enabled	MBSFN Enabled	MBSFN Enabled	X
TDD	0	1	2	3	4	5	6	7	8	9
	X	X	X	MBSFN Enabled	MBSFN Enabled	X	X	MBSFN Enabled	MBSFN Enabled	X

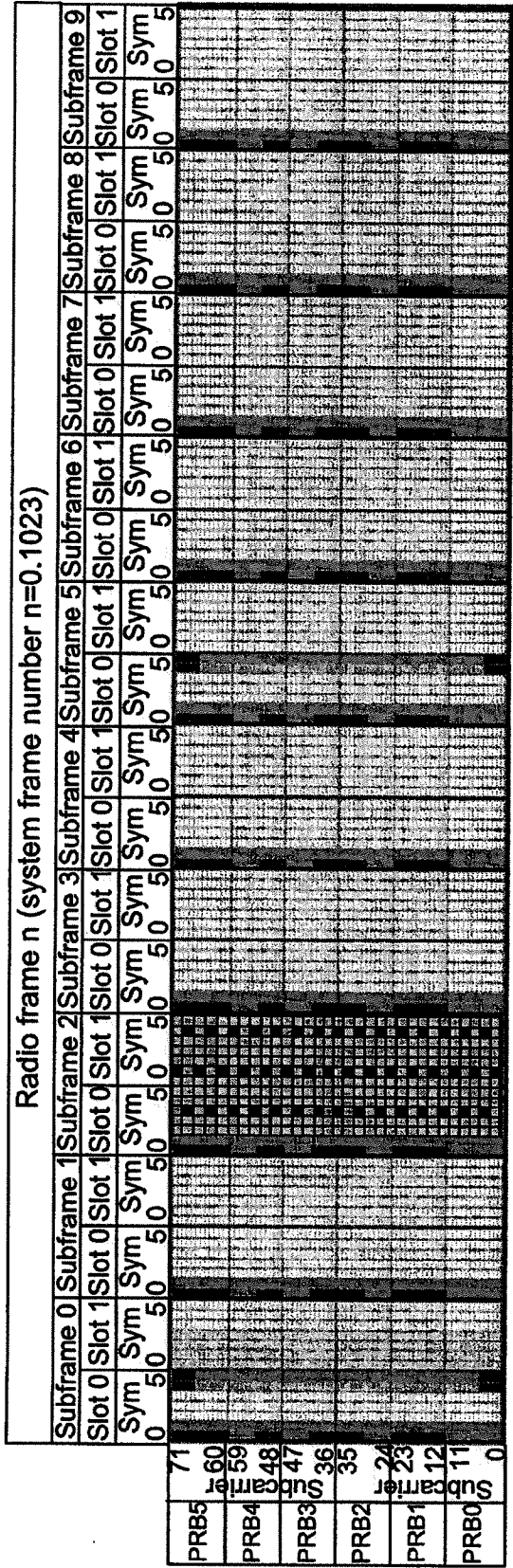


Fig. 19 Prior Art

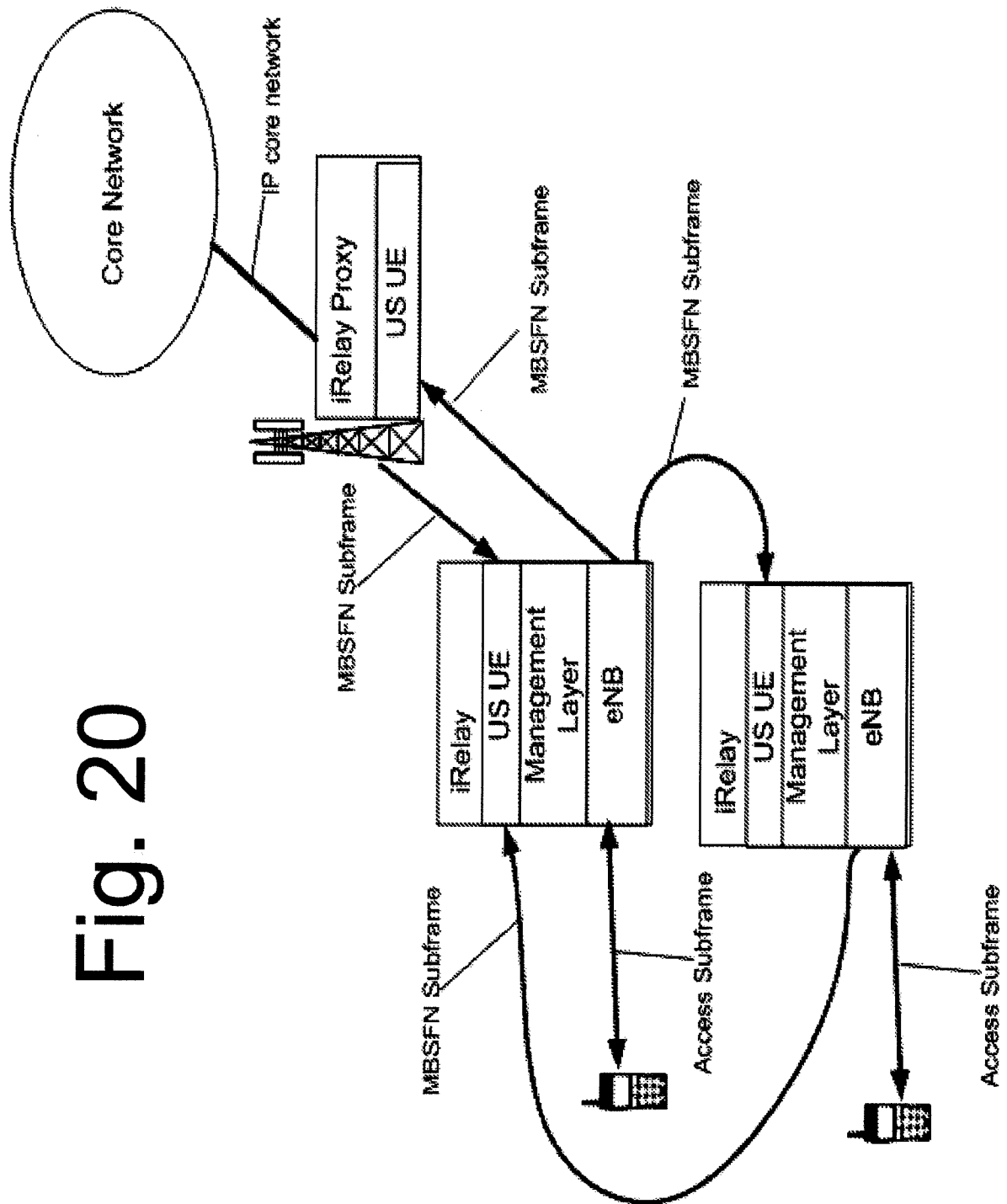


Fig. 21

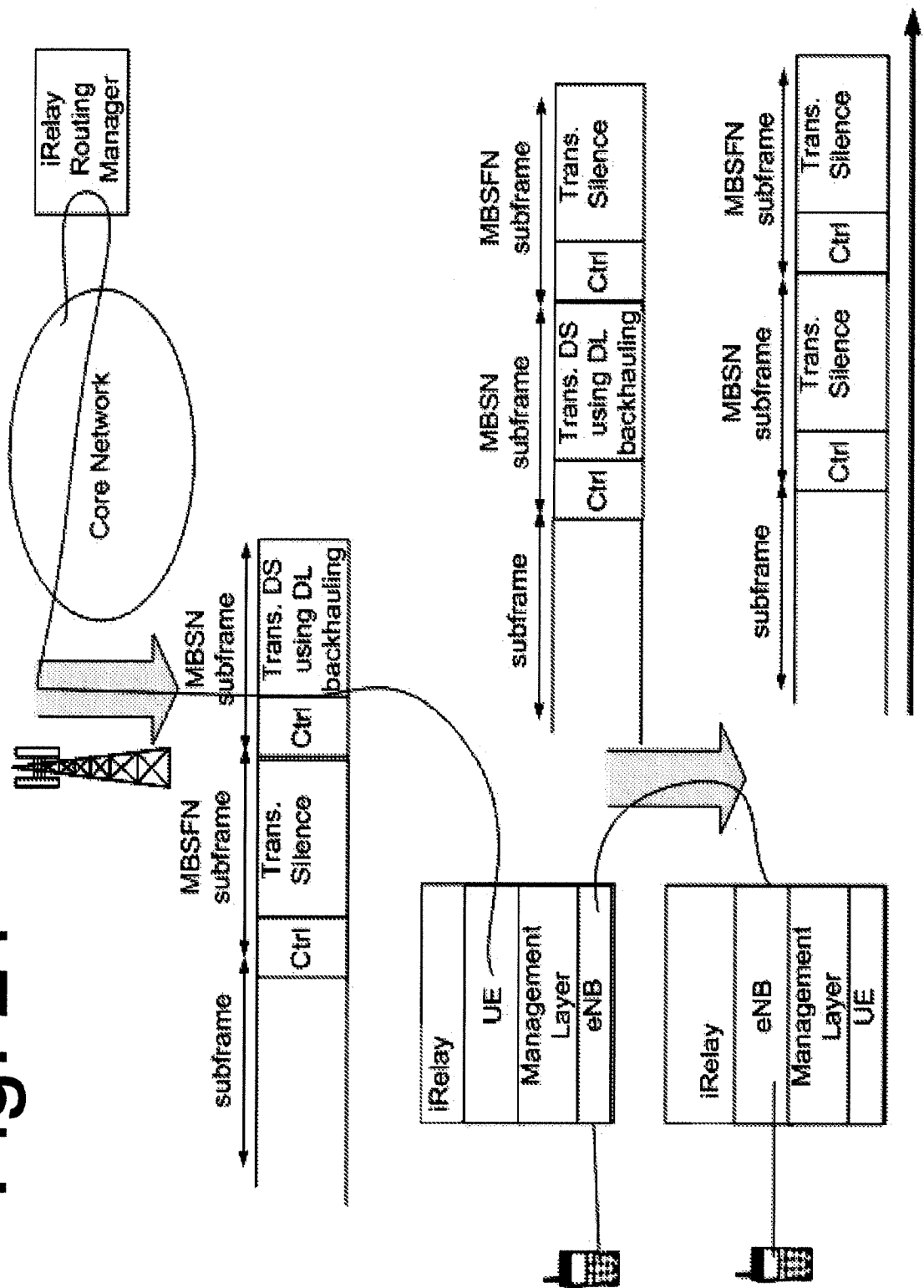


Fig. 22

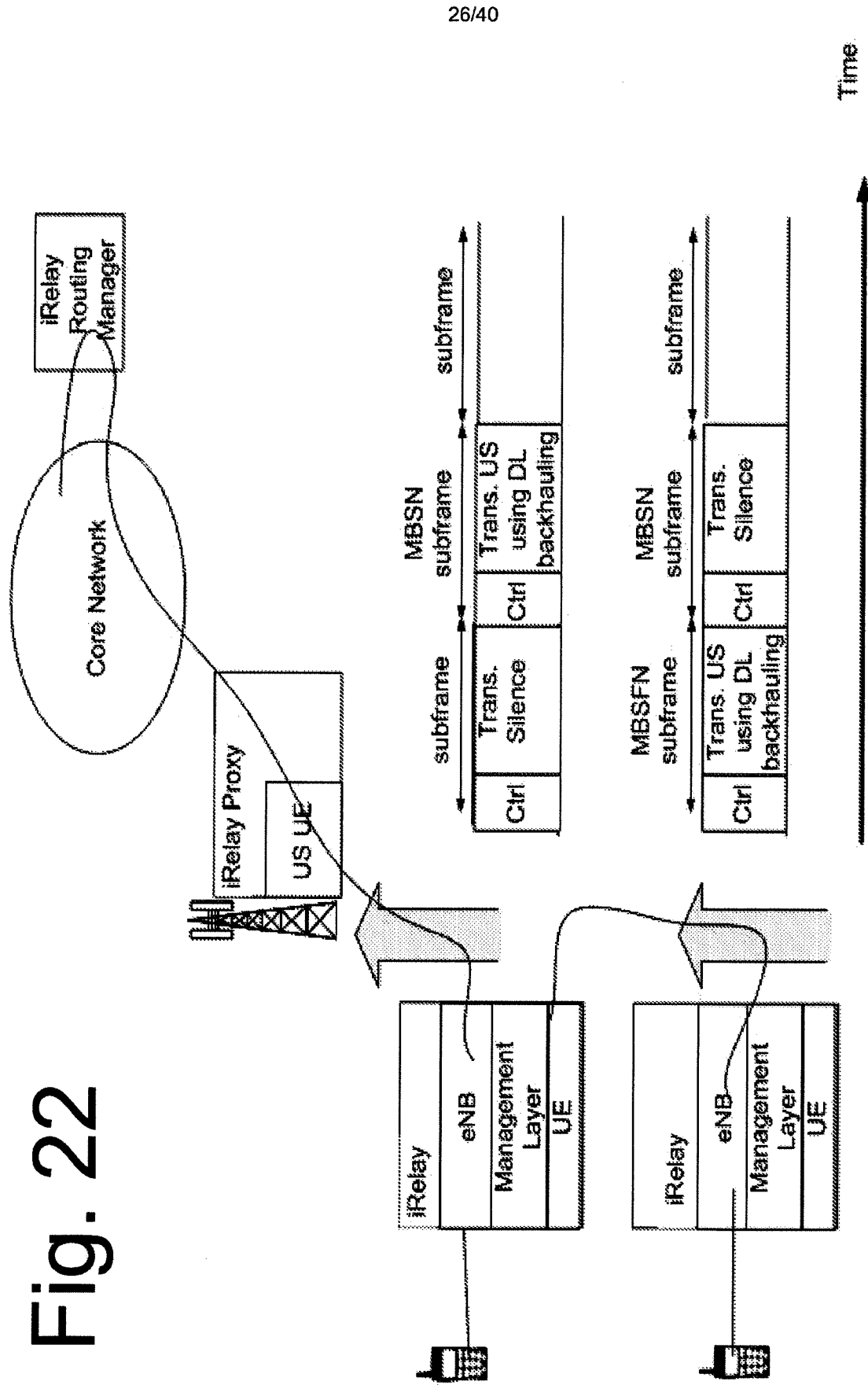
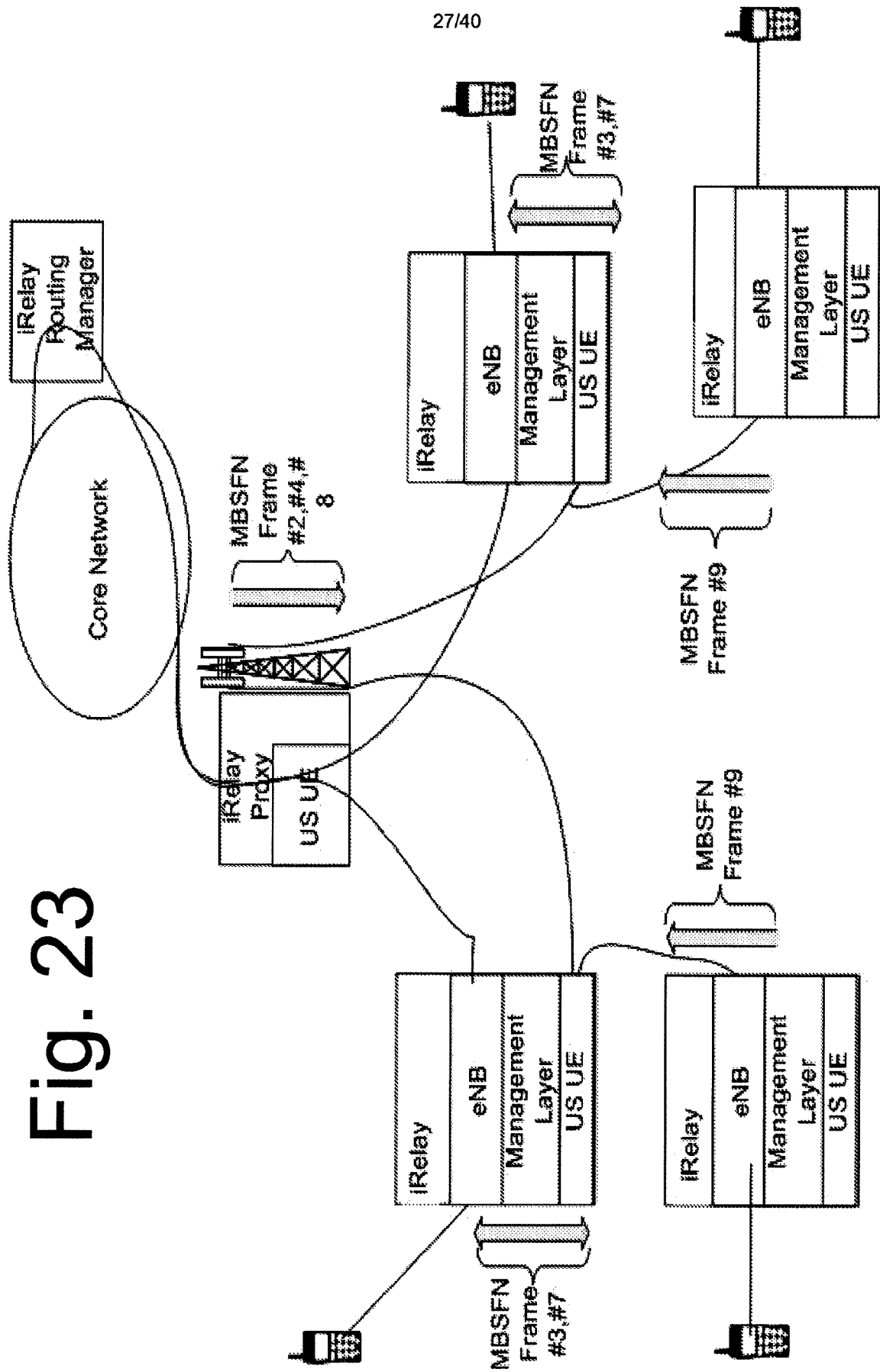


Fig. 23



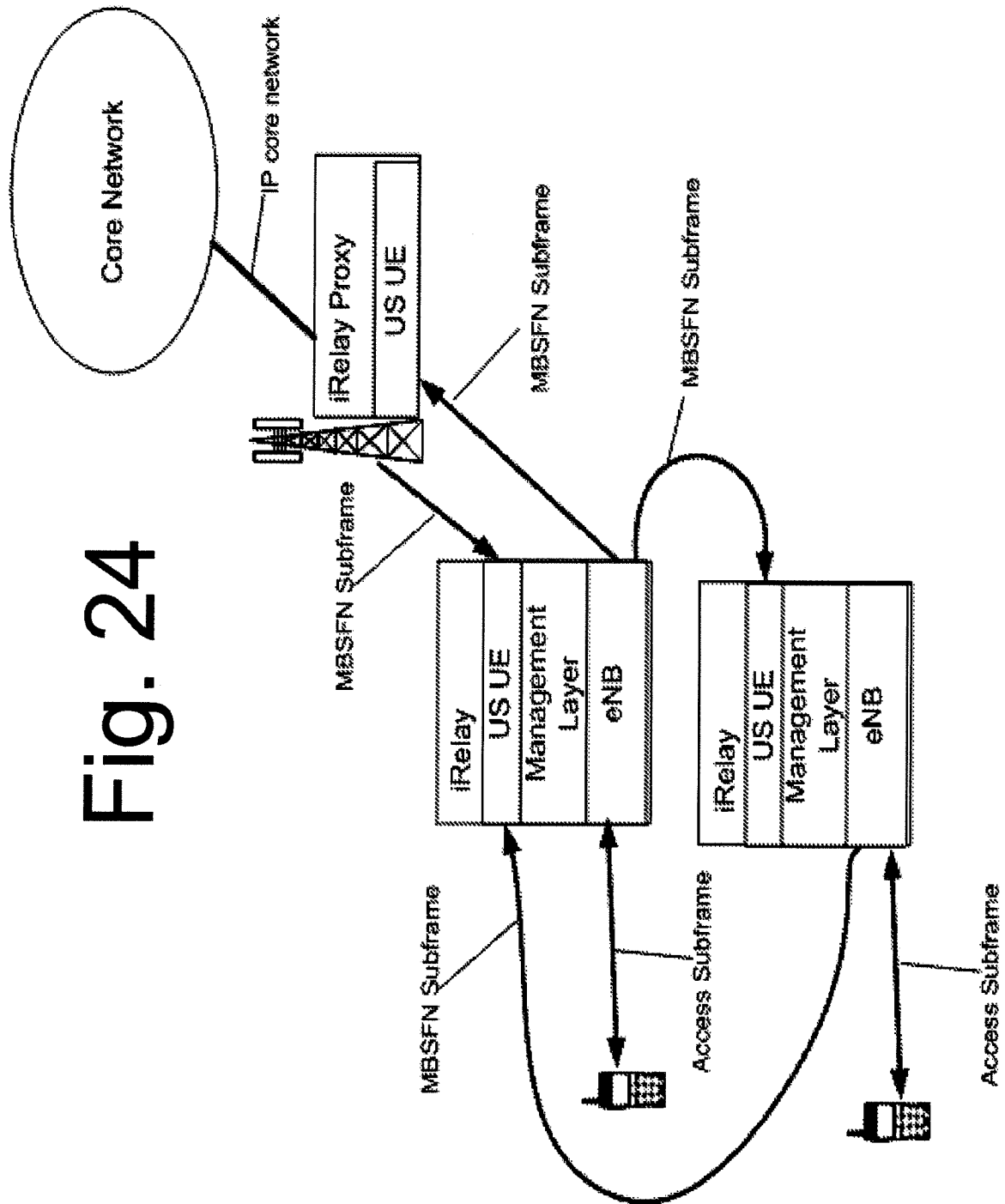
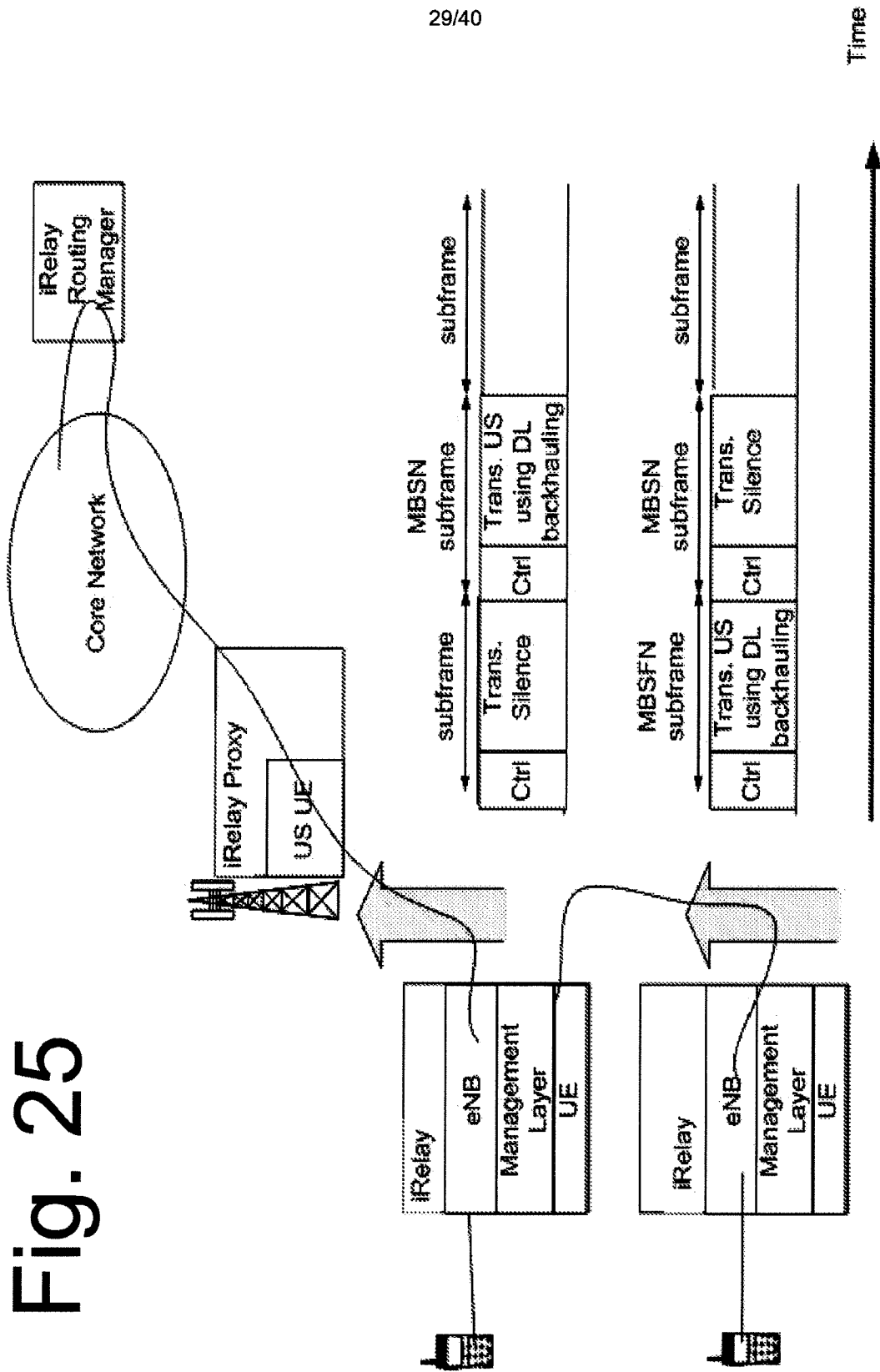


Fig. 25



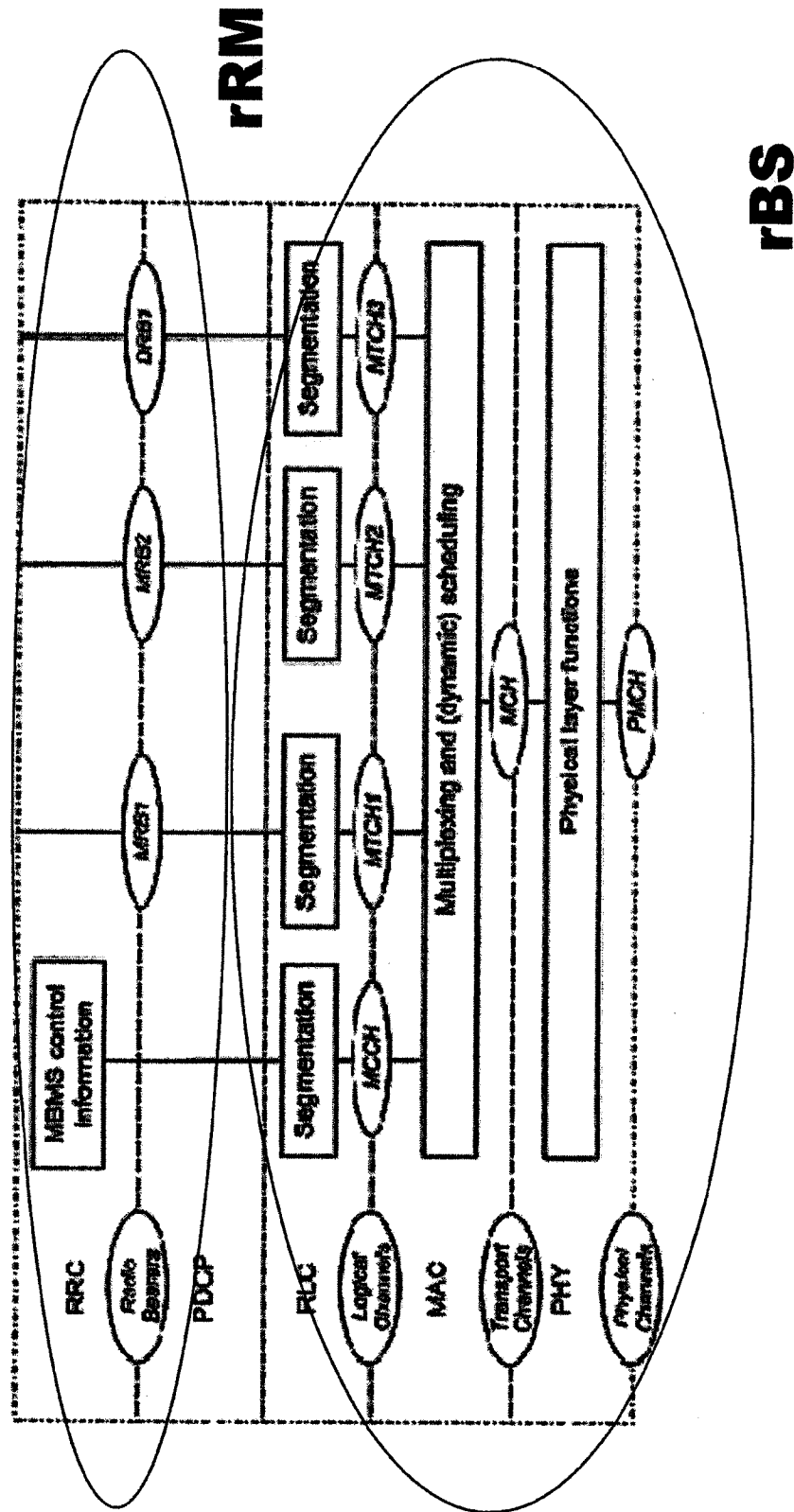


Fig. 26

Fig. 27

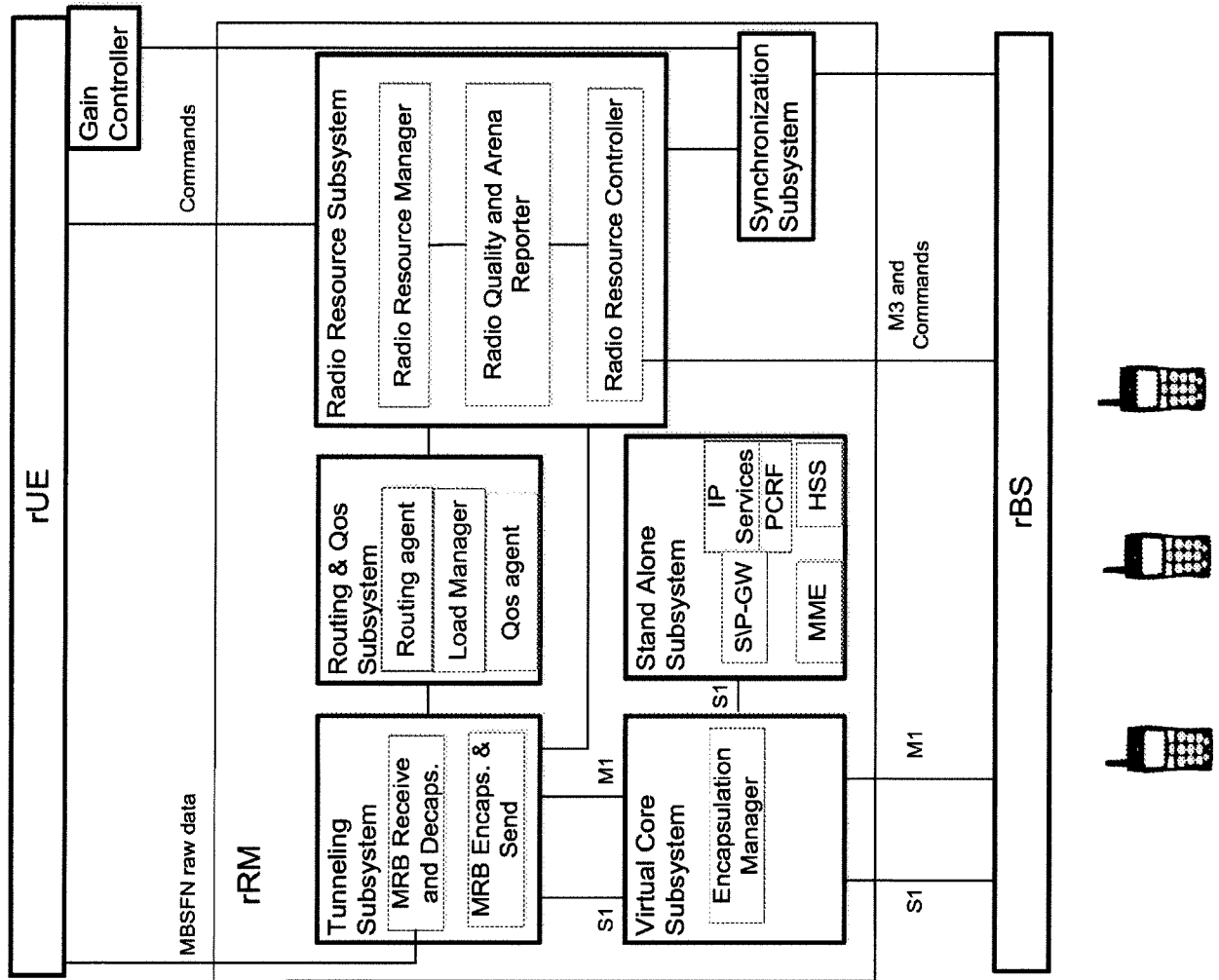
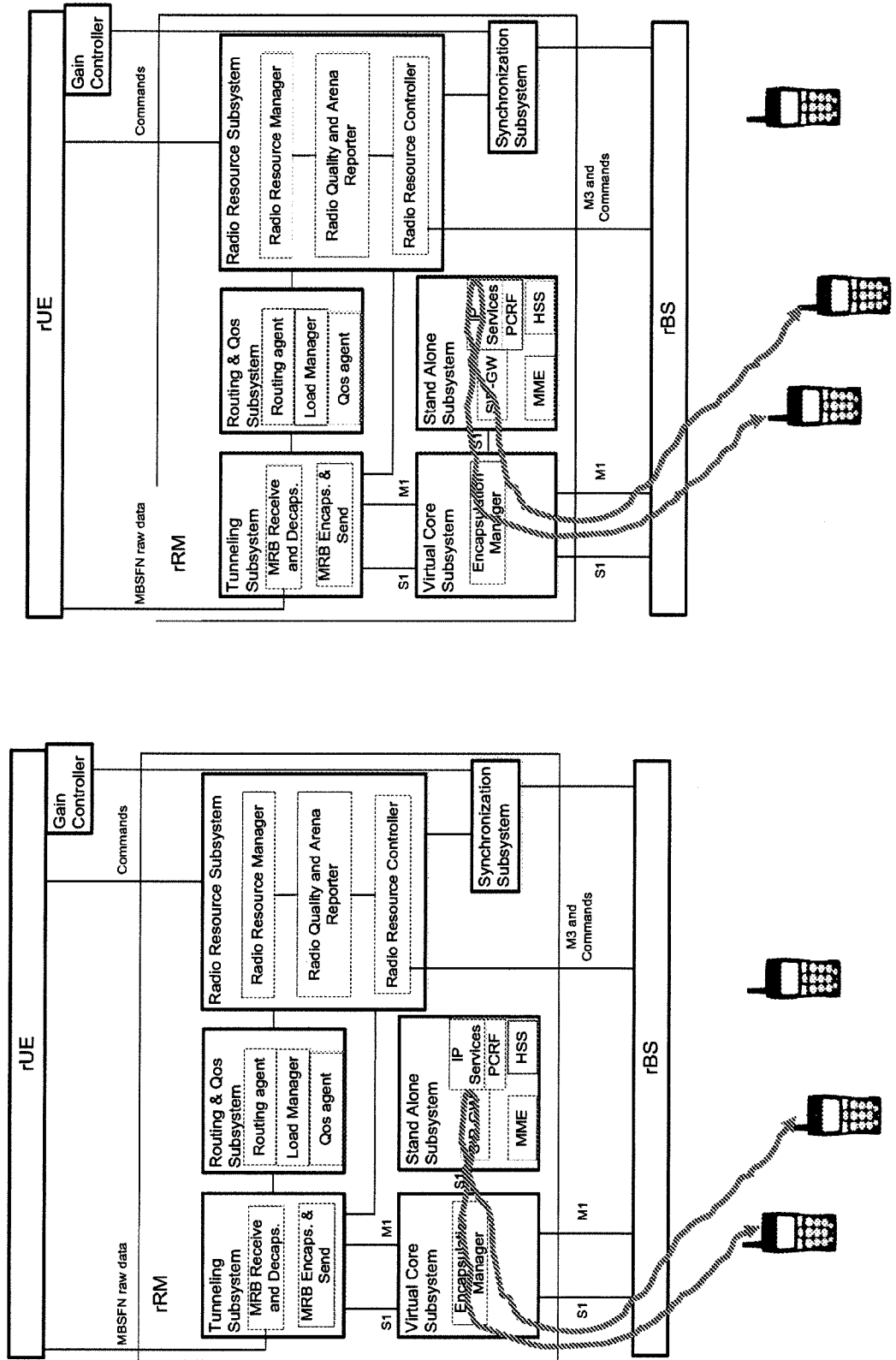


Fig. 28



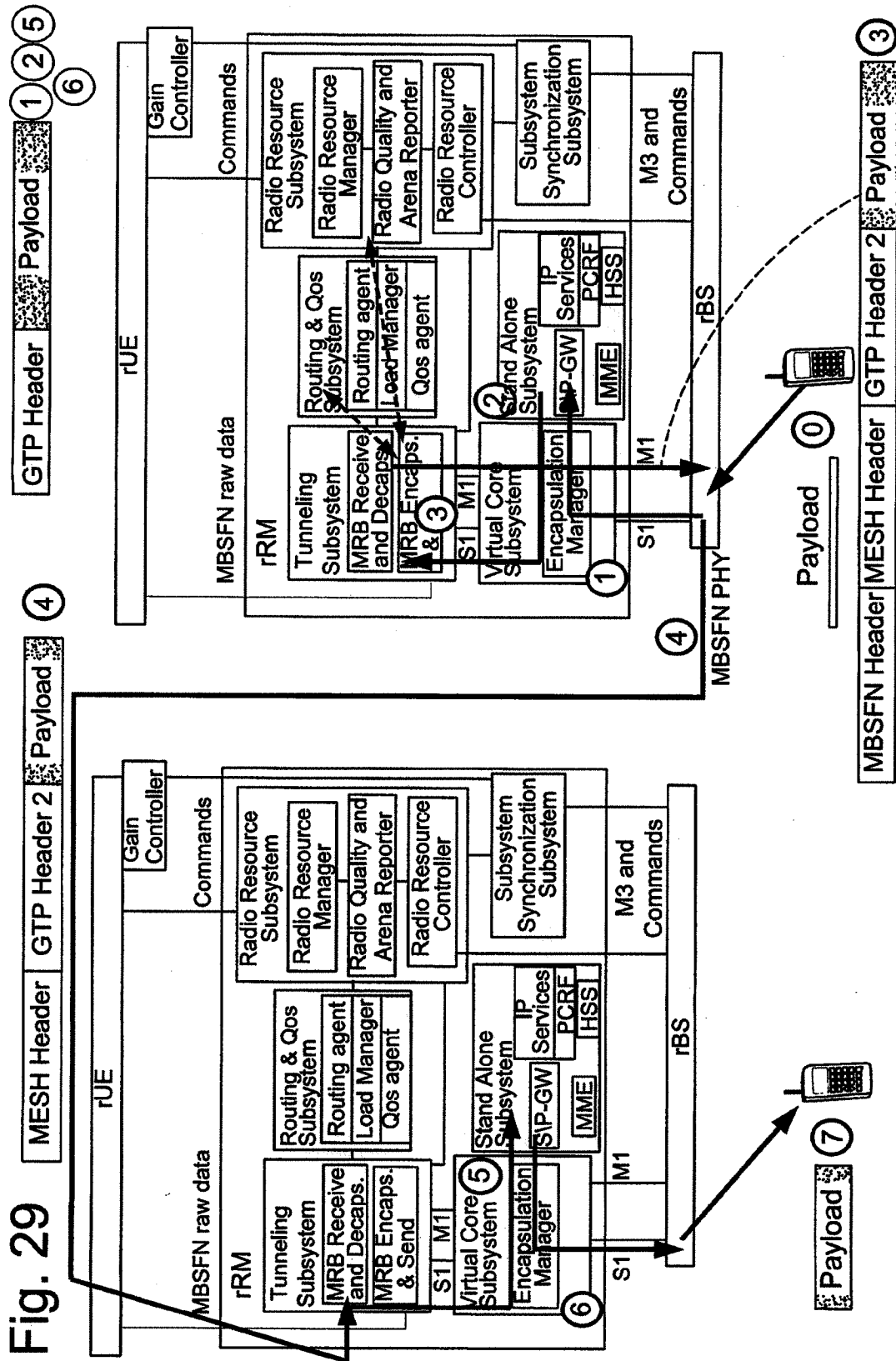


Fig. 30

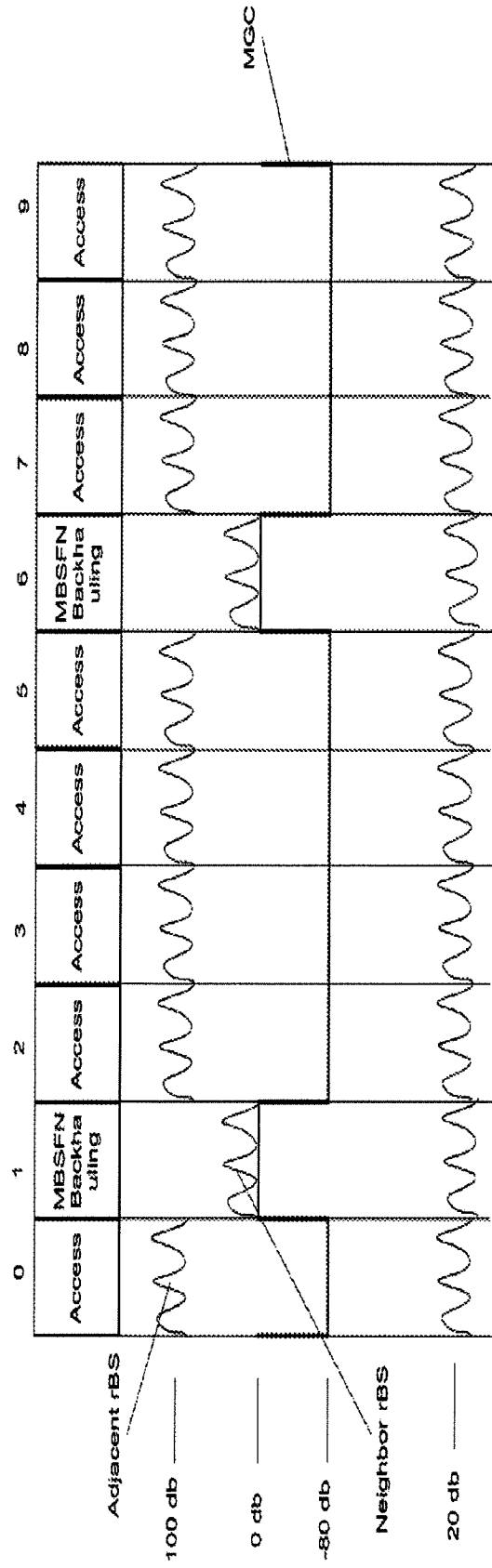


Fig. 31

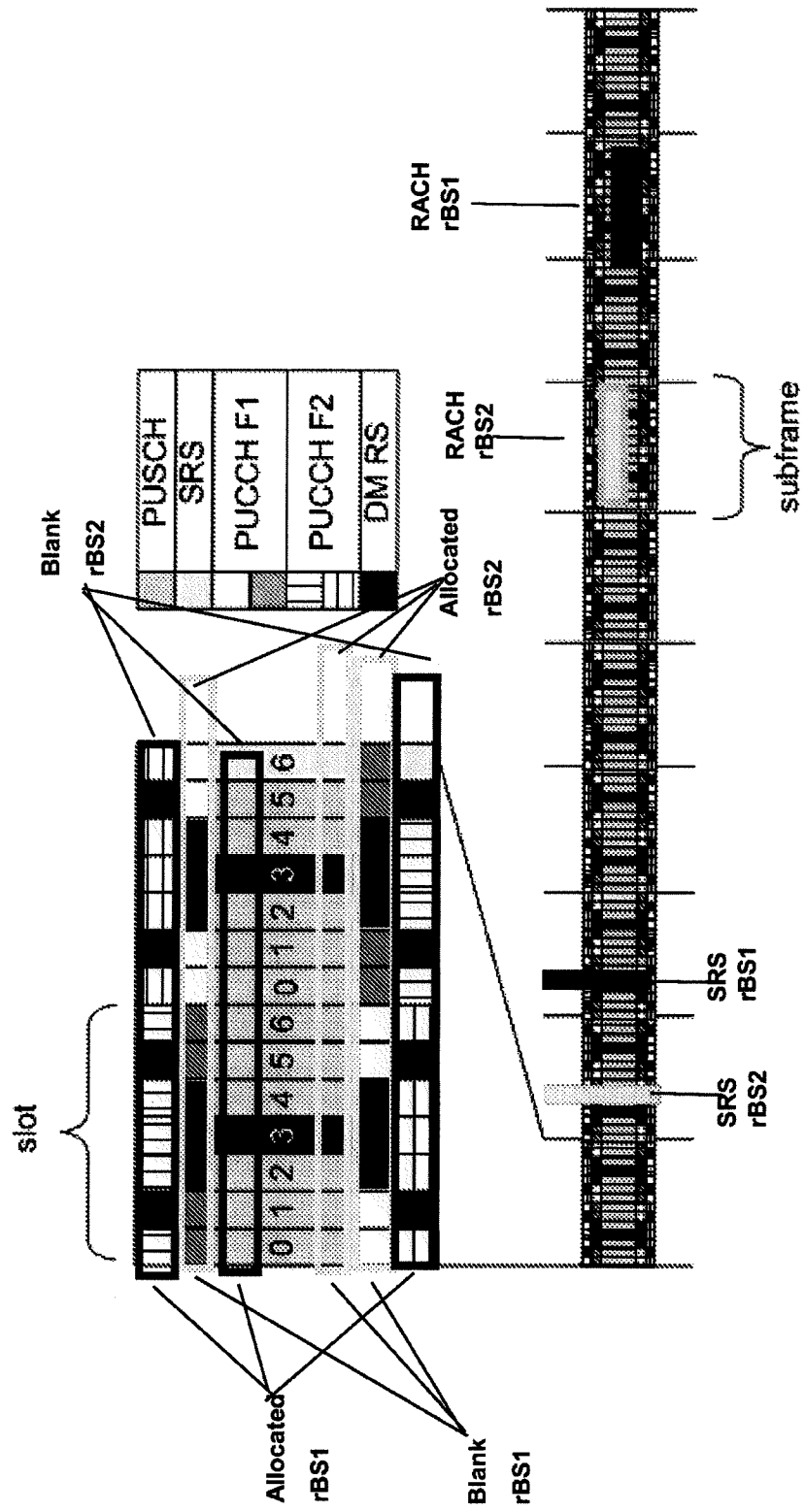


Fig. 32

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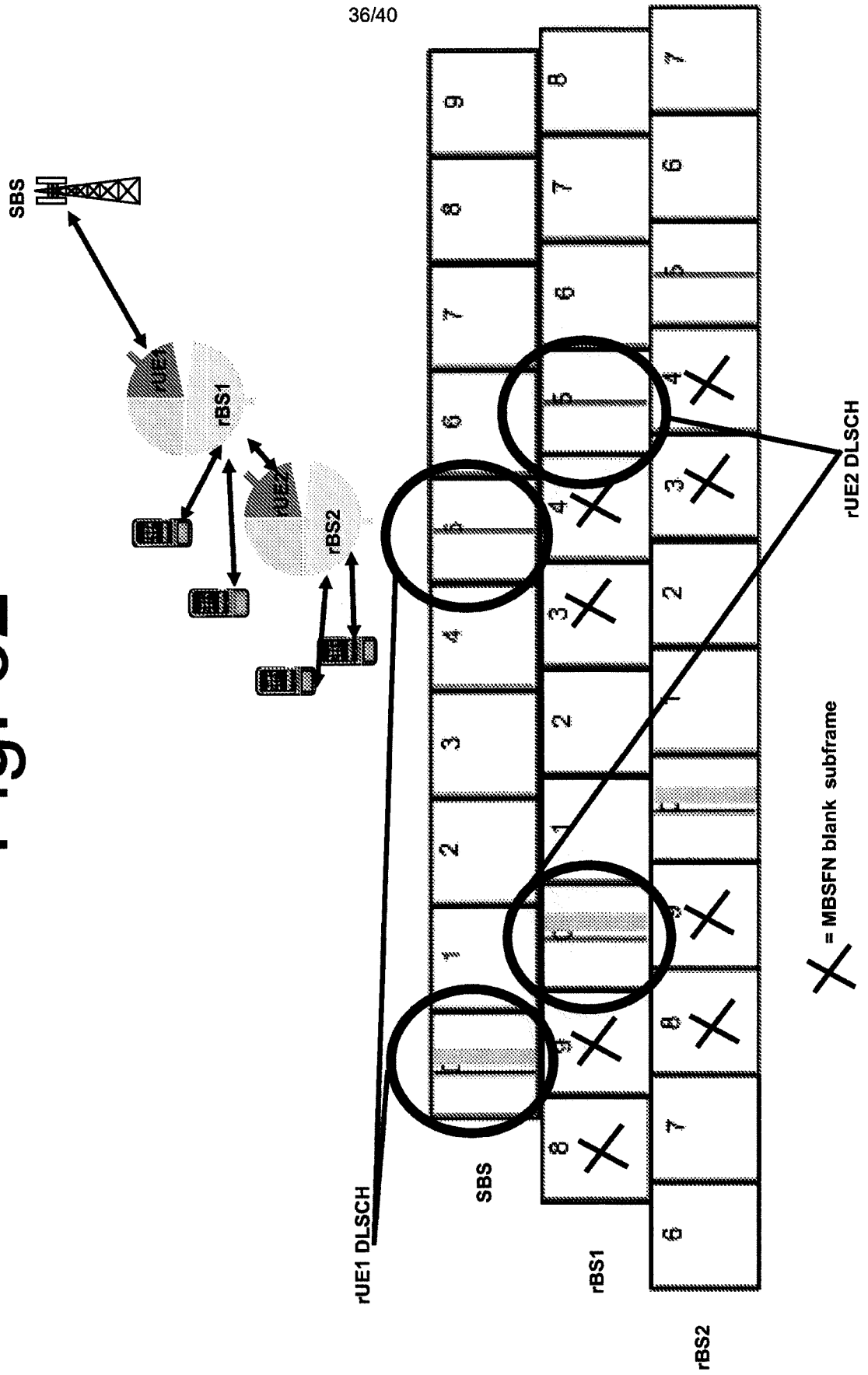
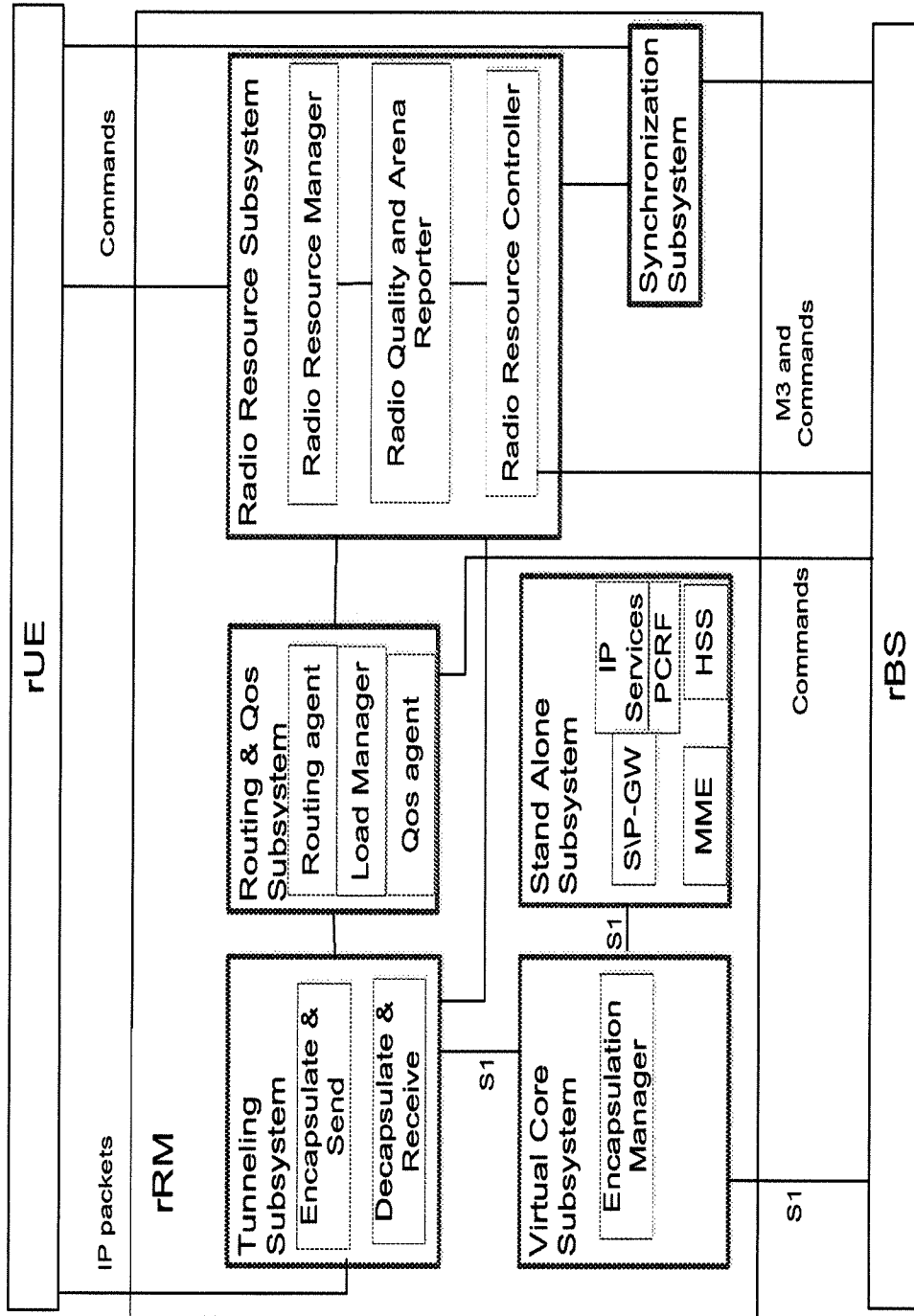
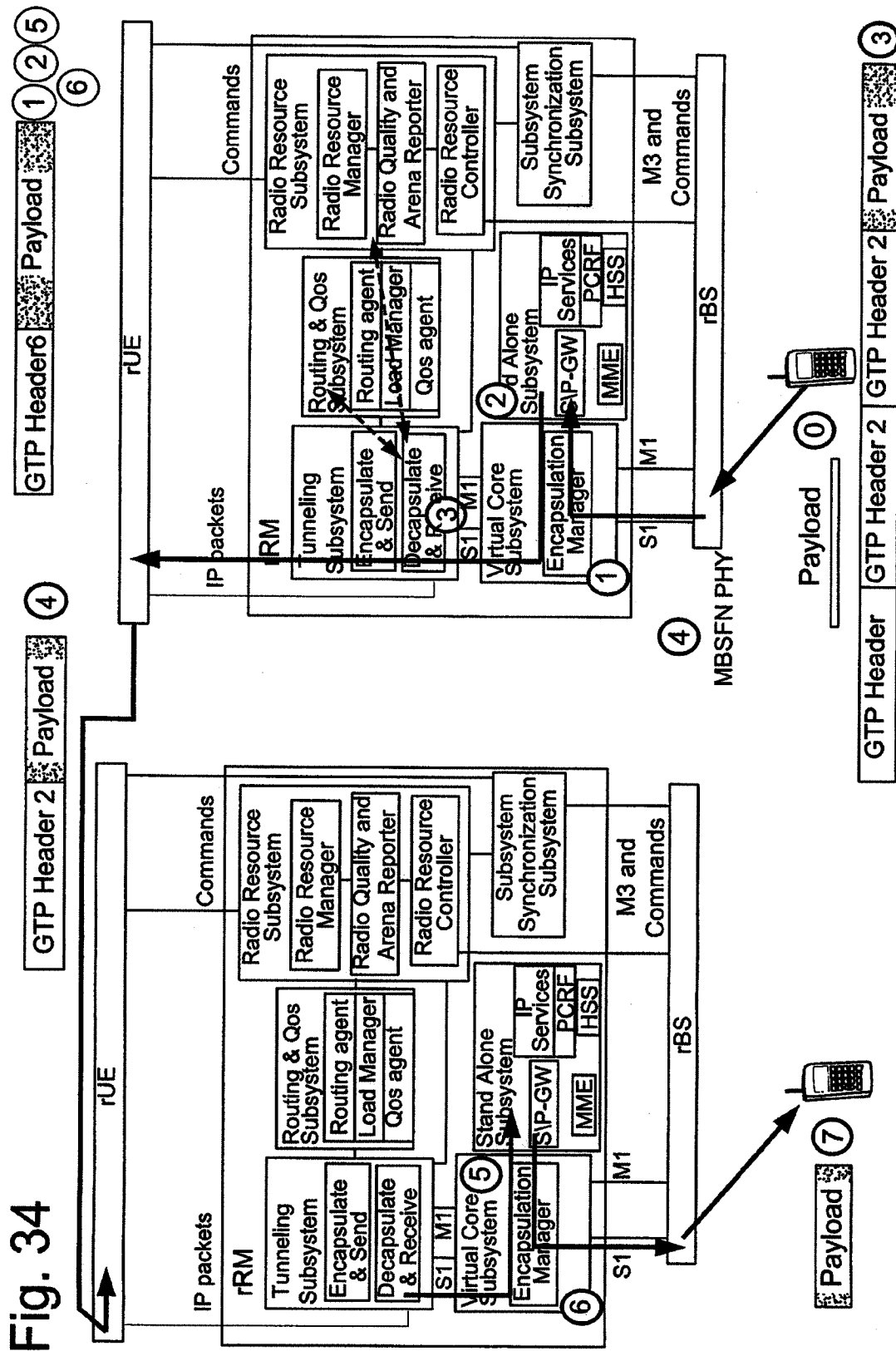


Fig. 33





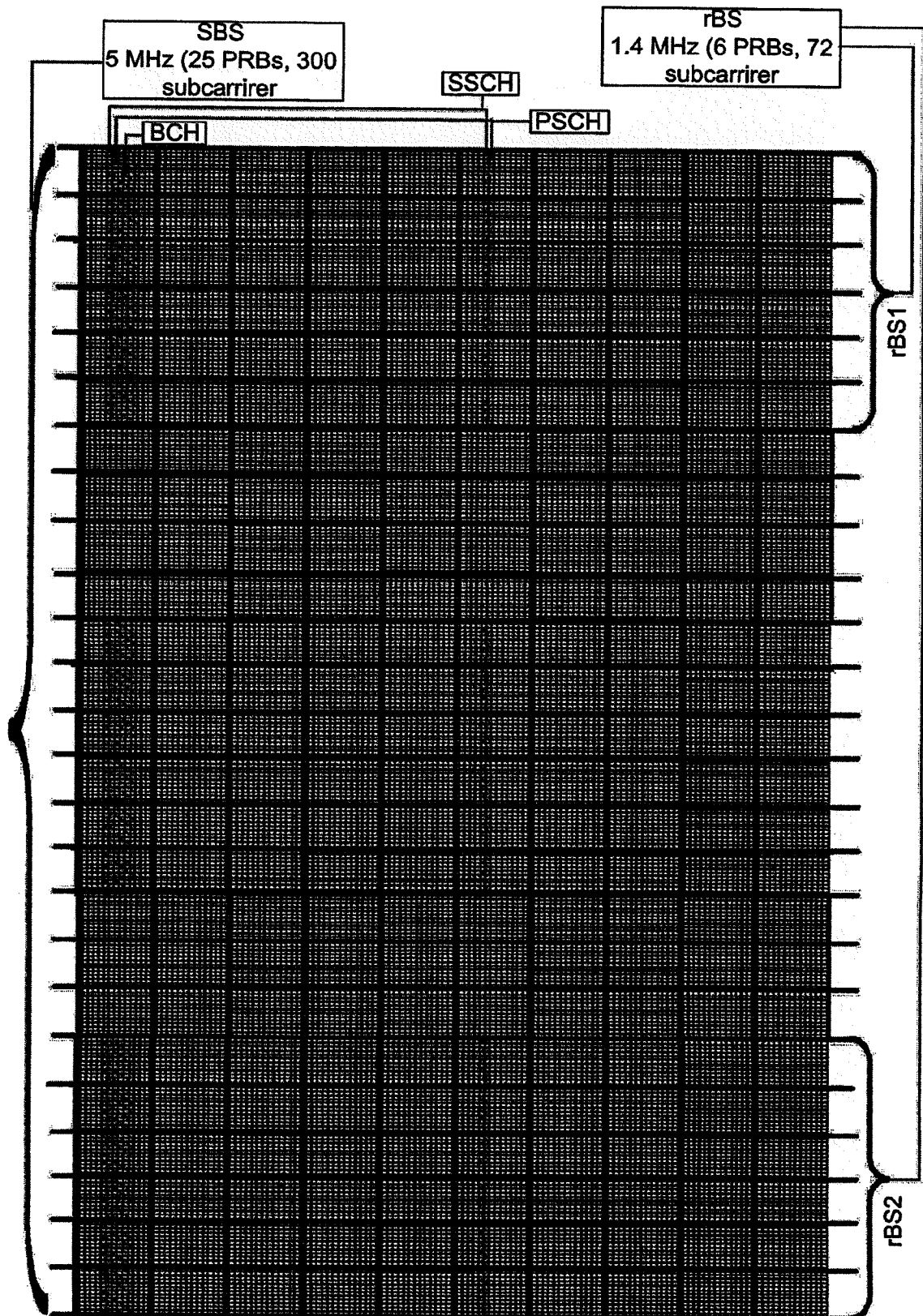


Fig. 35

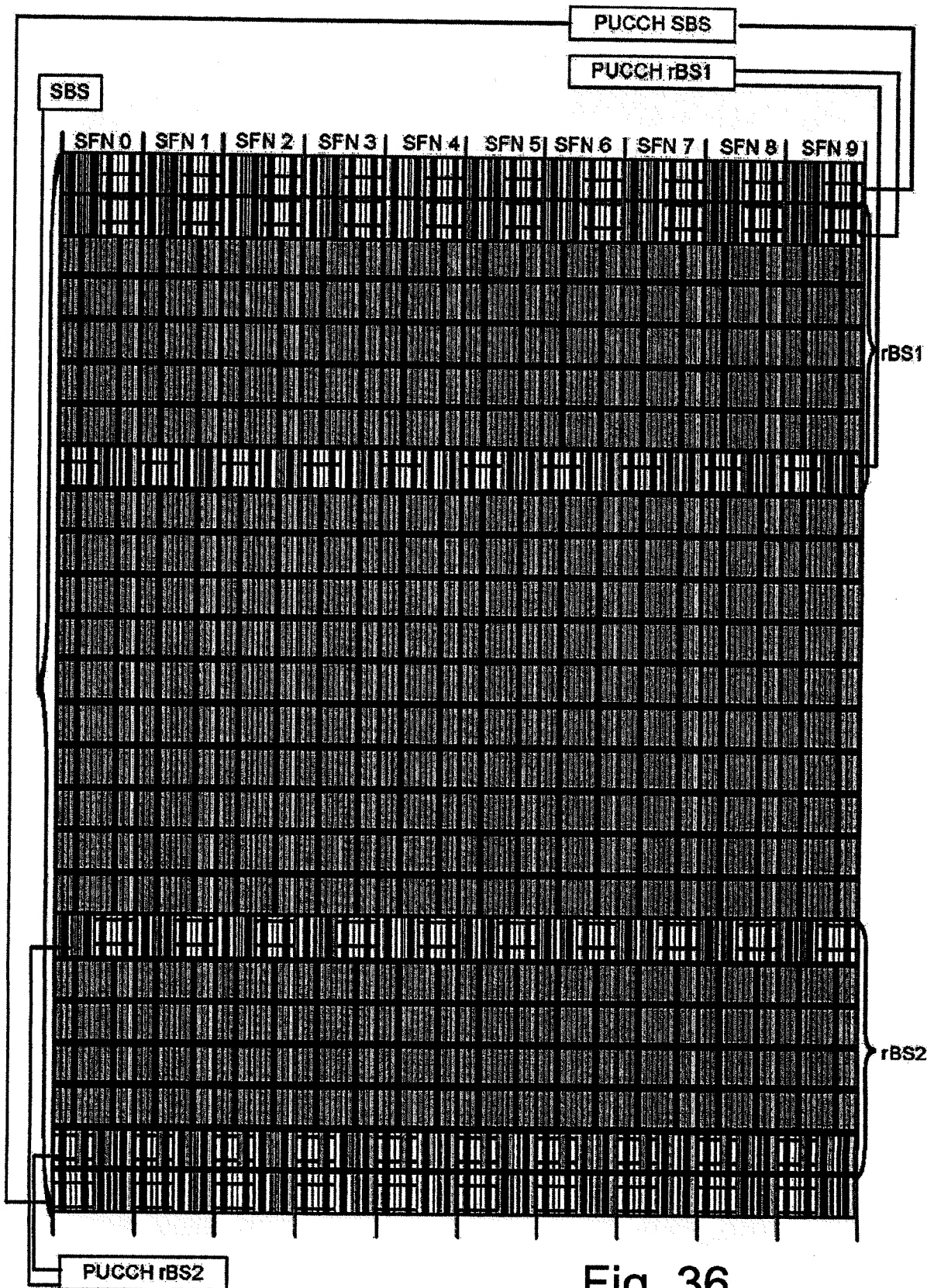


Fig. 36