

# System Architecture 2018 Fall Intro LTE Chap7: Cell Acquisition

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# DL FDD Frame Structure Example

3MHz 15 Resource Blocks  
 Normal CP : 5 OFDM in one slot  
 1<sup>st</sup> antenna port of two  
 Not used x will be RS of 2<sup>nd</sup> antenna port

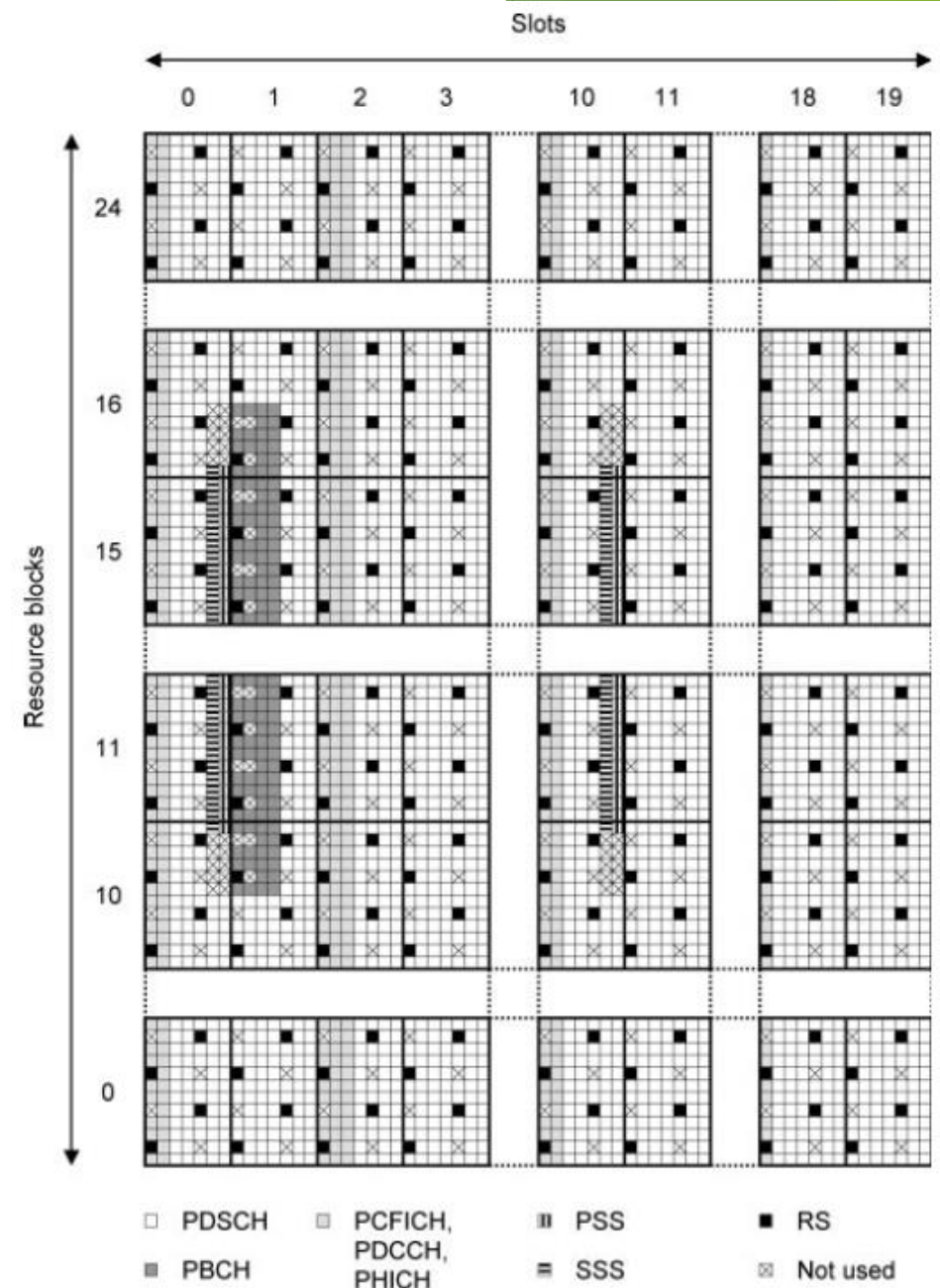


Figure 6.10 Example mapping of physical channels to resource elements in the downlink, using FDD mode, a normal cyclic prefix, a 5 MHz bandwidth, the first antenna port of two and a physical cell ID of 1.

# UL FDD Frame Structure Example

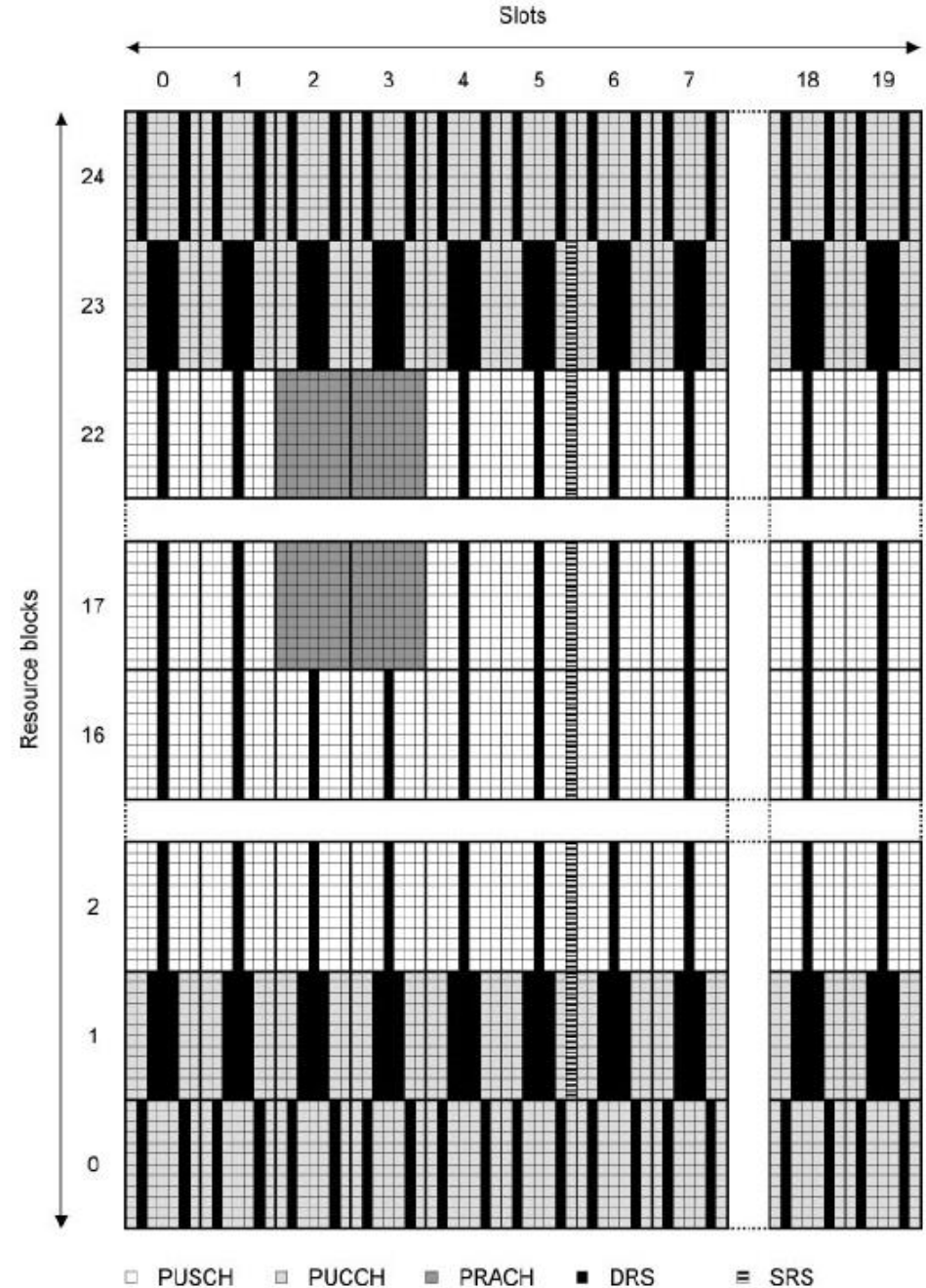


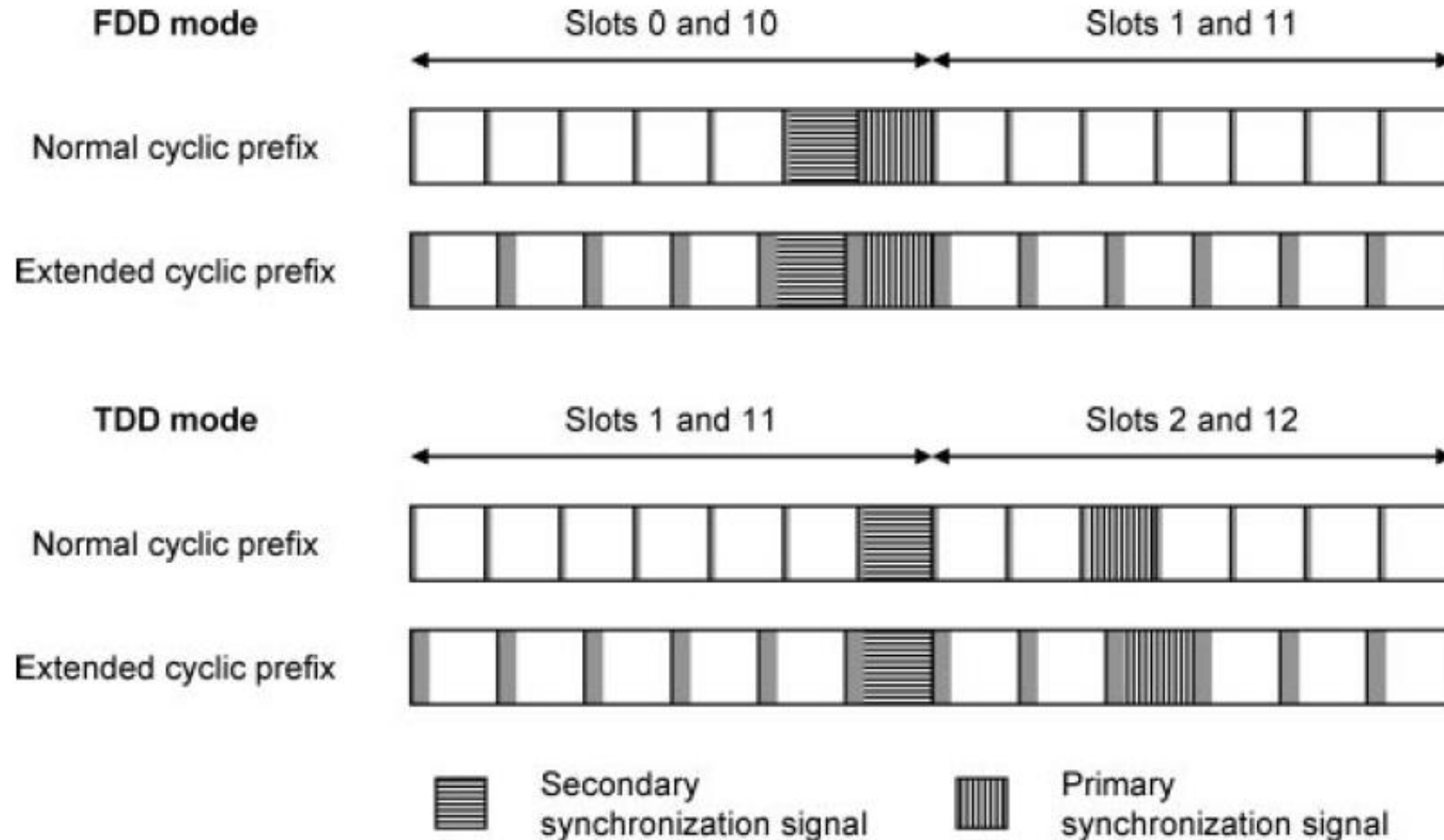
Figure 6.11 Example mapping of physical channels to resource elements in the uplink, using FDD mode, a normal cyclic prefix, a 5 MHz bandwidth and example configurations for the PUCCH, PRACH and SRS.

# Acquisition Procedure

**Table 7.1** Steps in the cell acquisition procedure

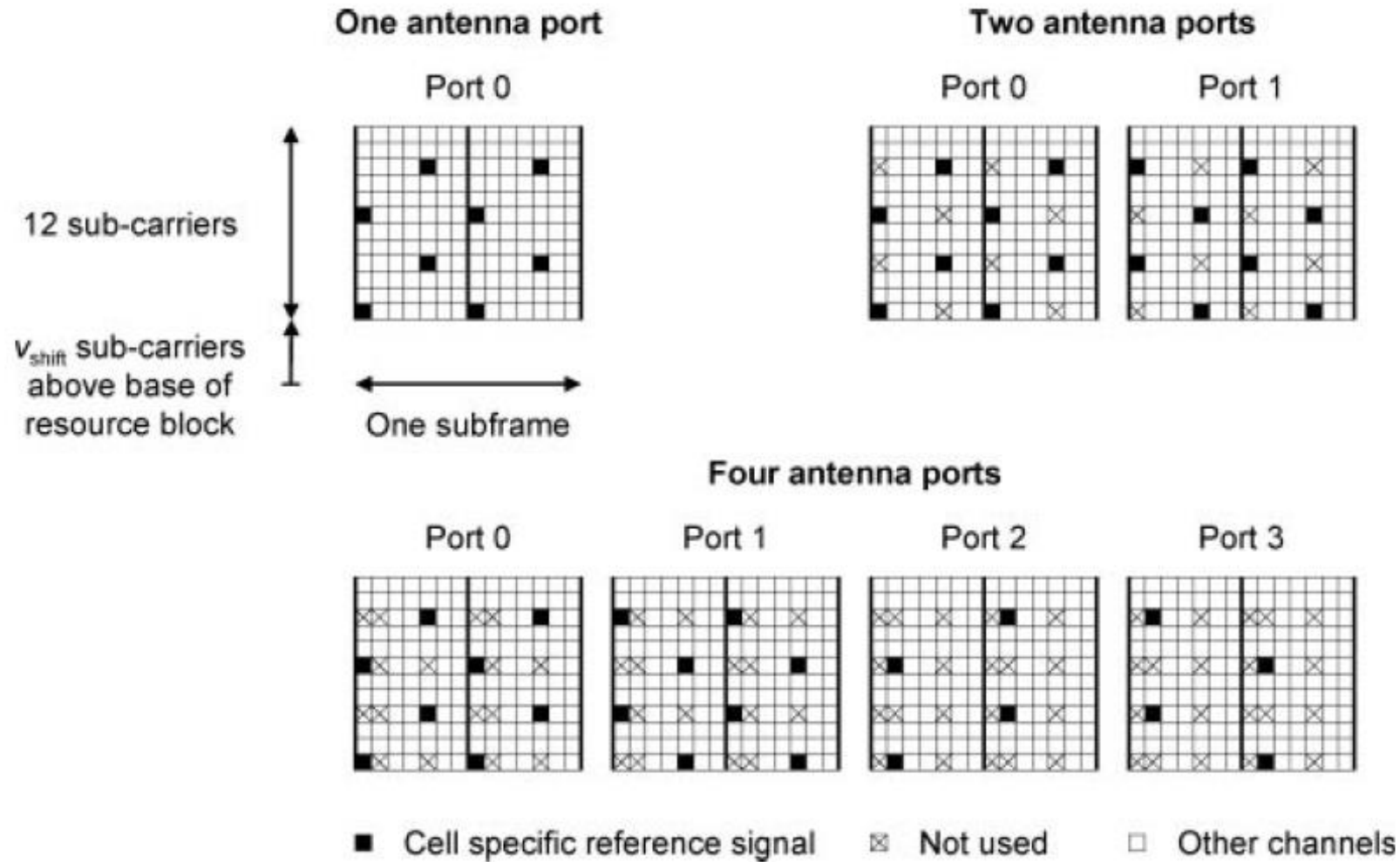
Step	Task	Information obtained
1	Receive PSS	Symbol timing Cell identity within group
2	Receive SSS	Frame timing Physical cell identity Transmission mode Cyclic prefix duration
3	Start reception of RS	Amplitude and phase reference for demodulation Power reference for channel quality estimation
4	Read MIB from PBCH	Number of transmit antennas Downlink bandwidth System frame number PHICH configuration
5	Start reception of PCFICH	Number of control symbols per subframe
6	Read SIBs from PDSCH	System information

# Acquisition Procedure



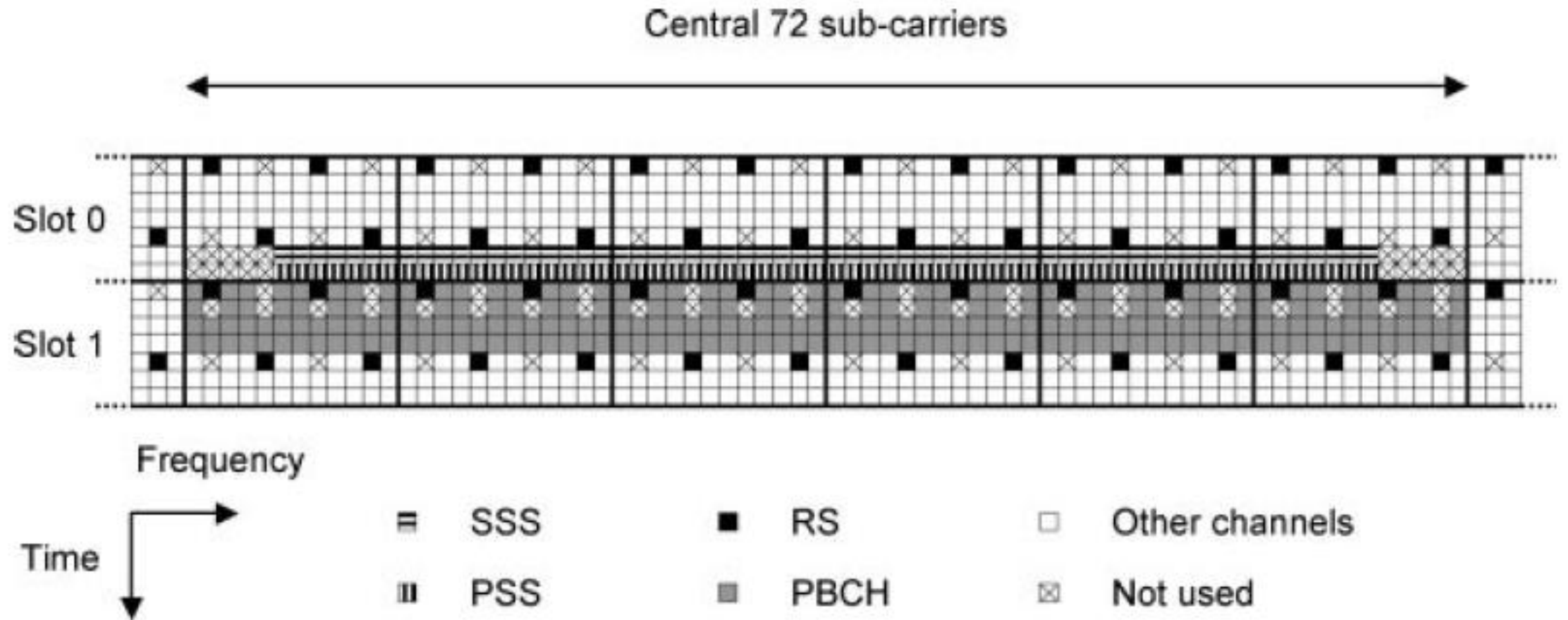
**Figure 7.1** Time domain mapping of the primary and secondary synchronization signals.

# Down Link Reference Signal



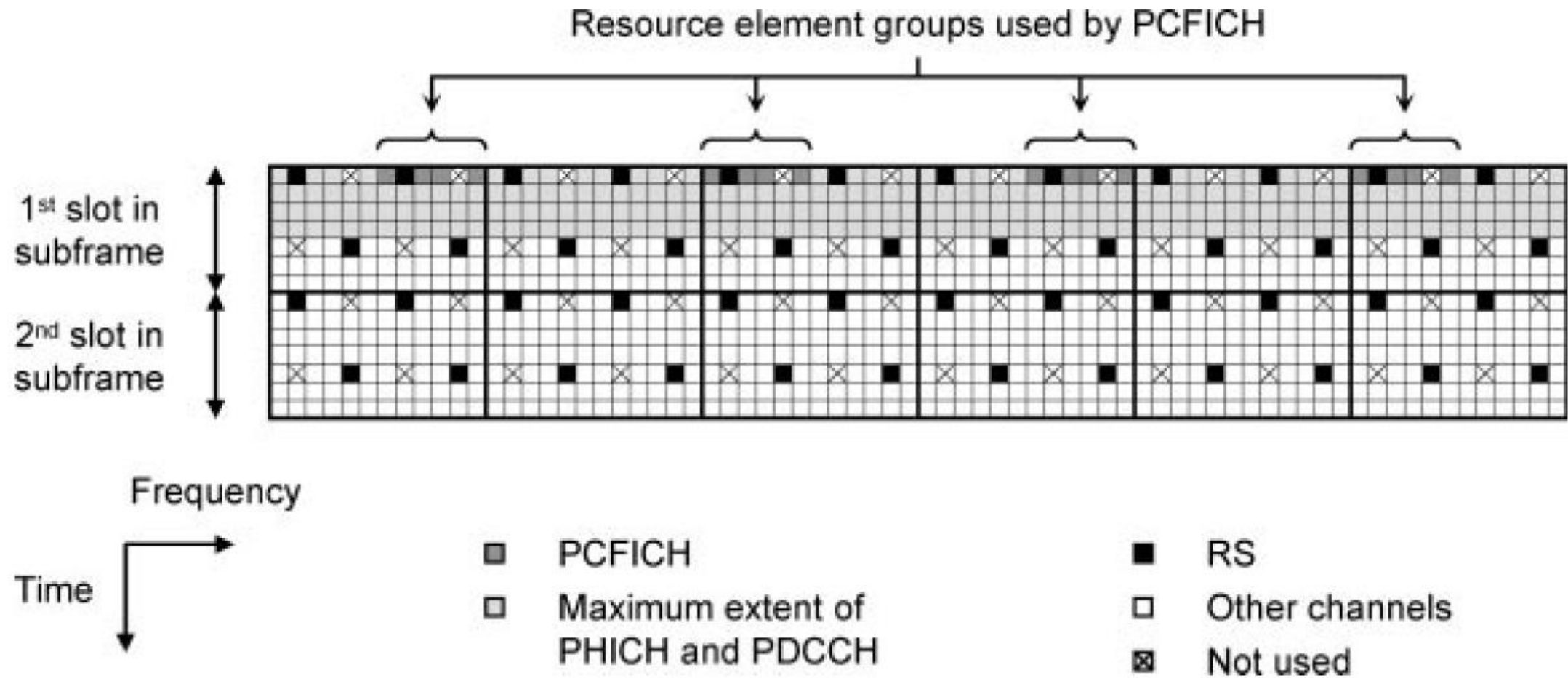
**Figure 7.2** Resource element mapping for the cell-specific reference signals, using a normal cyclic prefix. Reproduced by permission of ETSI.

# Physical Broadcast Channel



**Figure 7.3** Resource element mapping for the PBCH, using FDD mode, a normal cyclic prefix, a 10 or 20 MHz bandwidth, the first antenna port of two and a physical cell ID of 1.

# Physical Control Format Indicate Channel



**Figure 7.4** Resource element mapping for the PCFICH, using a normal cyclic prefix, a 1.4 MHz bandwidth, the first antenna port of two and a physical cell ID of 1.



# System Information

**Table 7.2** Organization of the system information

Block	Release	Information	Examples
MIB	R8	Master information block	Downlink bandwidth PHICH configuration System frame number/4
SIB 1	R8	Cell selection parameters Scheduling of other SIBs	PLMN identity list Tracking area code CSG identity TDD configuration $Q_{rxlevmin}$ SIB mapping, period, window size
SIB 2	R8	Radio resource configuration	Downlink reference signal power Default DRX cycle length Time alignment timer
SIB 3	R8	Common cell reselection data	$S_{IntraSearchP}$ , $S_{NonIntraSearchP}$
		Cell independent intra frequency data	$Q_{hyst}$
SIB 4	R8	Cell specific intra frequency data	$Q_{offset, s, n}$
SIB 5	R8	Inter frequency reselection data	Target carrier frequency $Thresh_{x, LowP}$ , $Thresh_{x, HighP}$
SIB 6	R8	Reselection to UMTS	UMTS neighbour list
SIB 7	R8	Reselection to GSM	GSM neighbour list
SIB 8	R8	Reselection to cdma2000	cdma2000 neighbour list
SIB 9	R8	Home eNB identifier	Name of home eNB
SIB 10	R8	ETWS primary notification	ETWS alert about natural disaster
SIB 11	R8	ETWS secondary notification	Supplementary ETWS information
SIB 12	R9	CMAS notification	CMAS emergency message
SIB 13	R9	MBMS information	Details of MBSFN areas