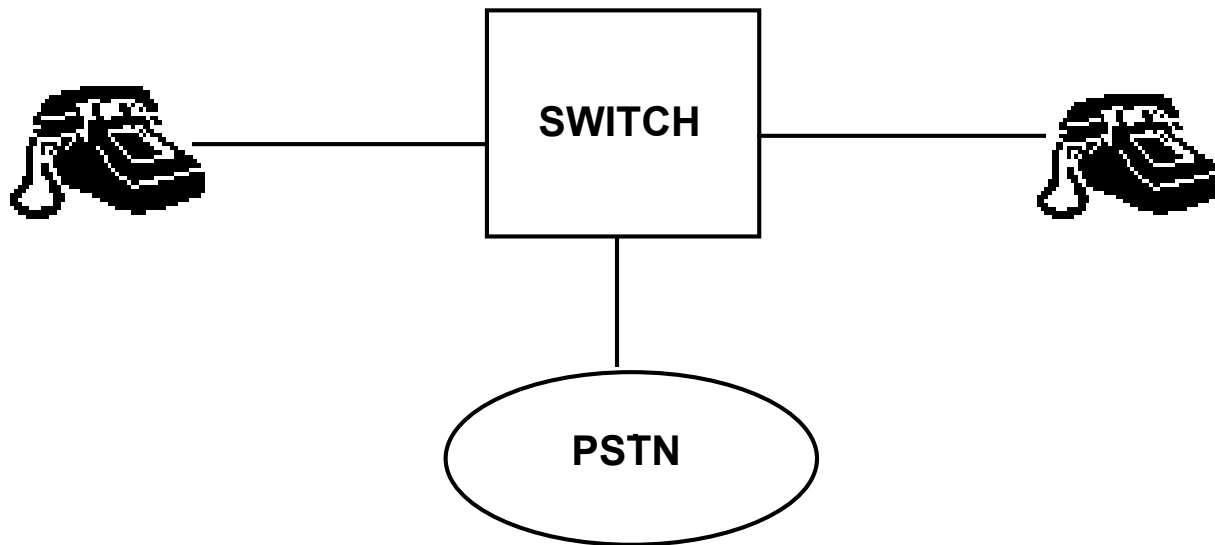


WIRELESS PERSONAL COMMUNICATIONS SYSTEMS

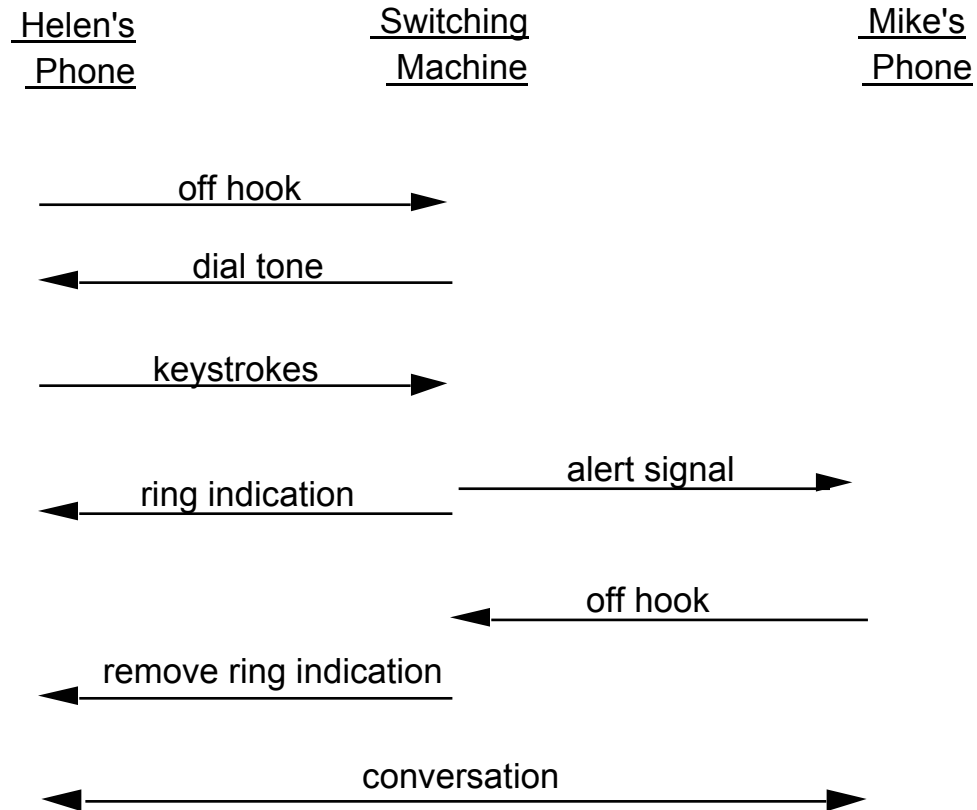
INTRODUCTION AND OVERVIEW

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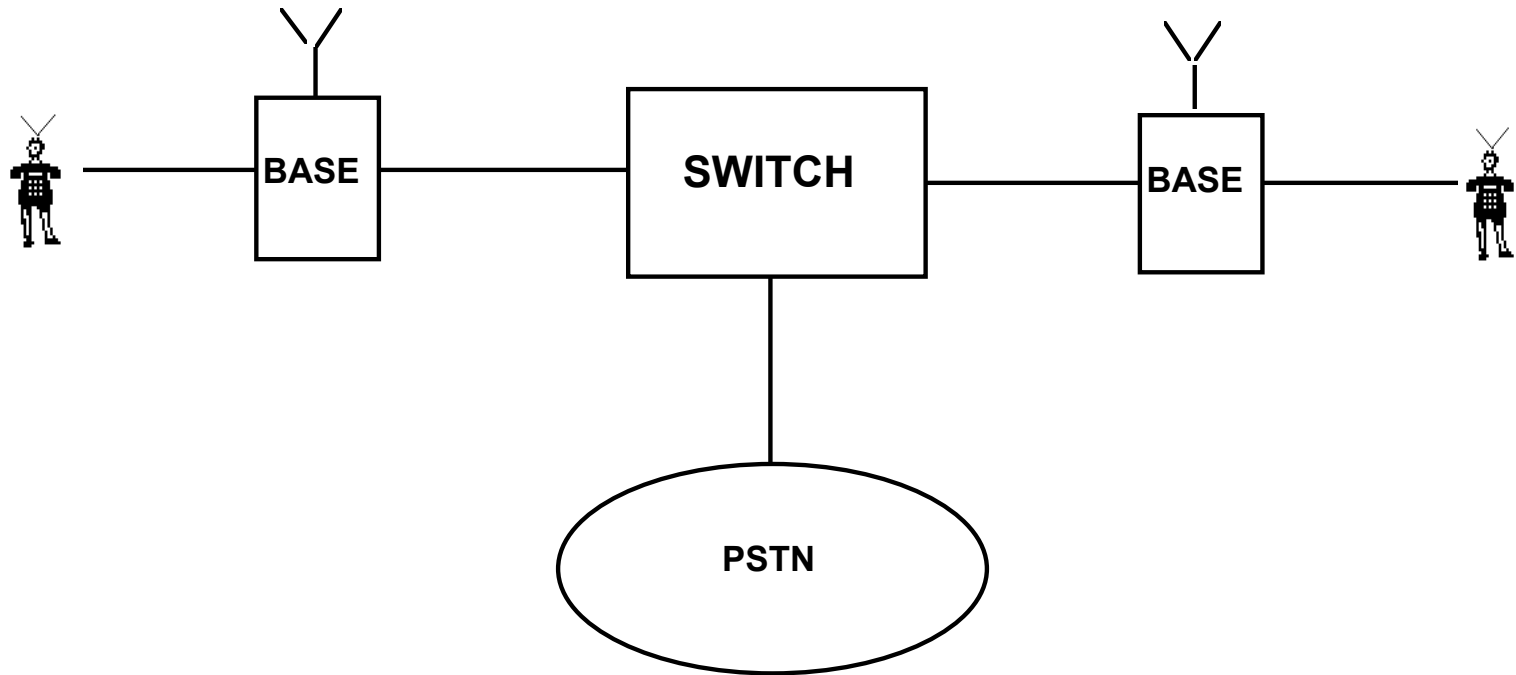
LOCAL PHONE CALL



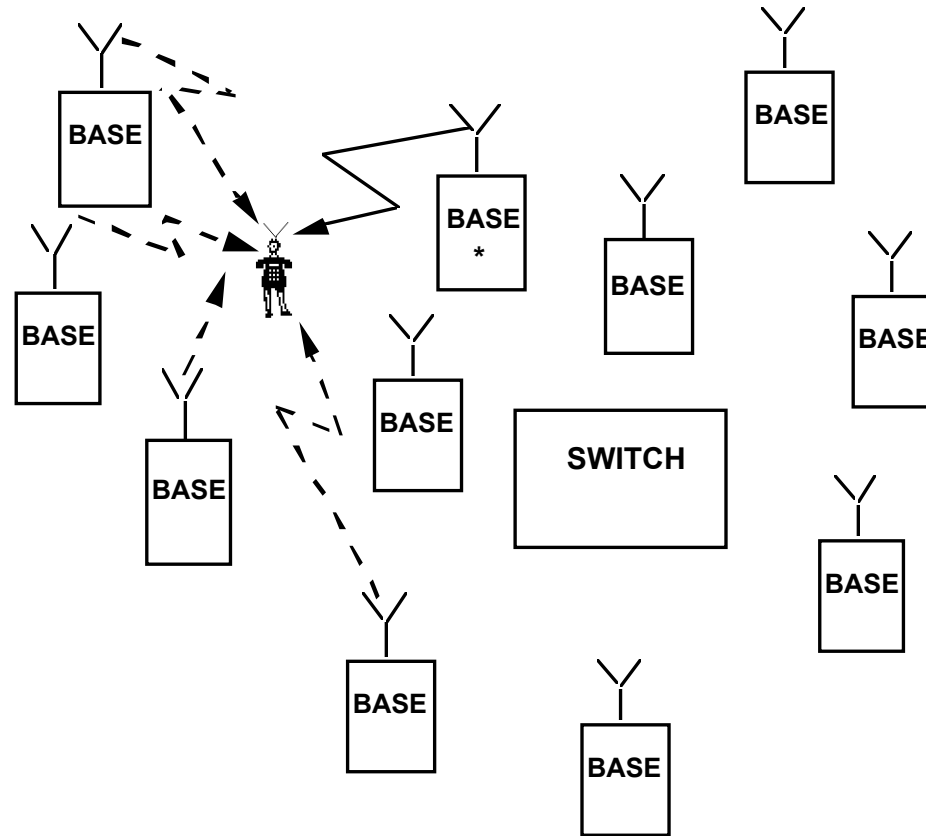
INFORMATION TRANSFER



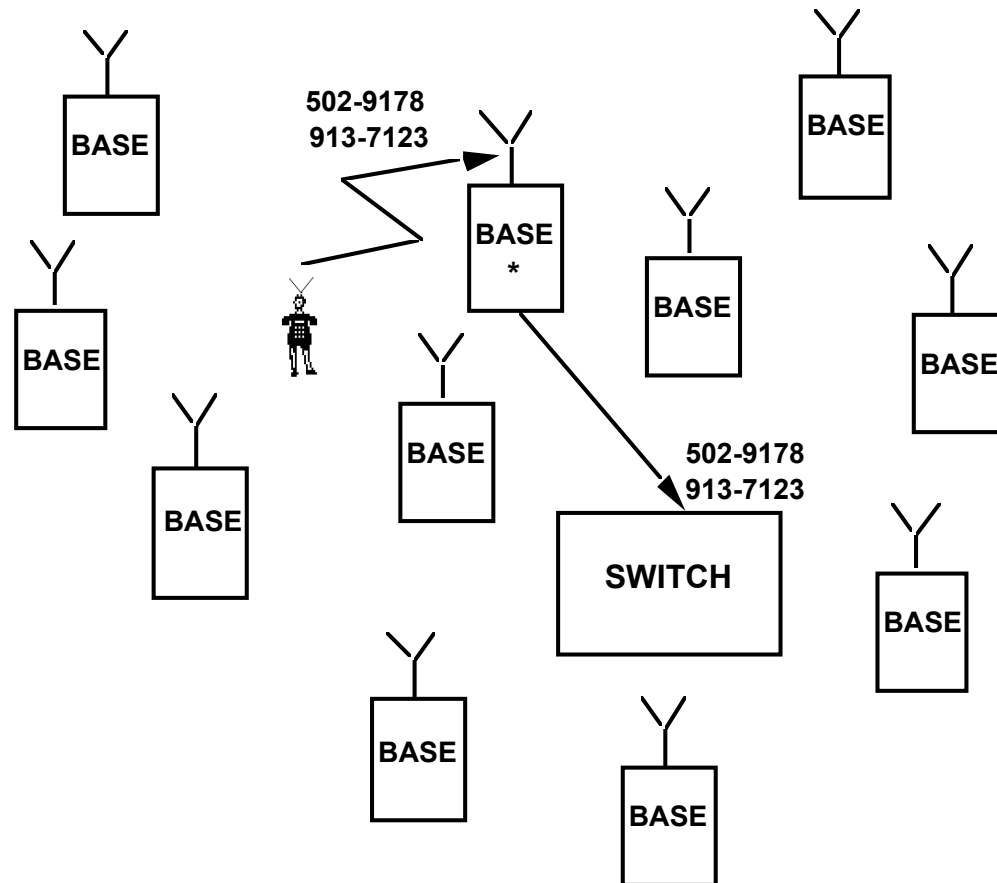
CELLULAR NETWORK



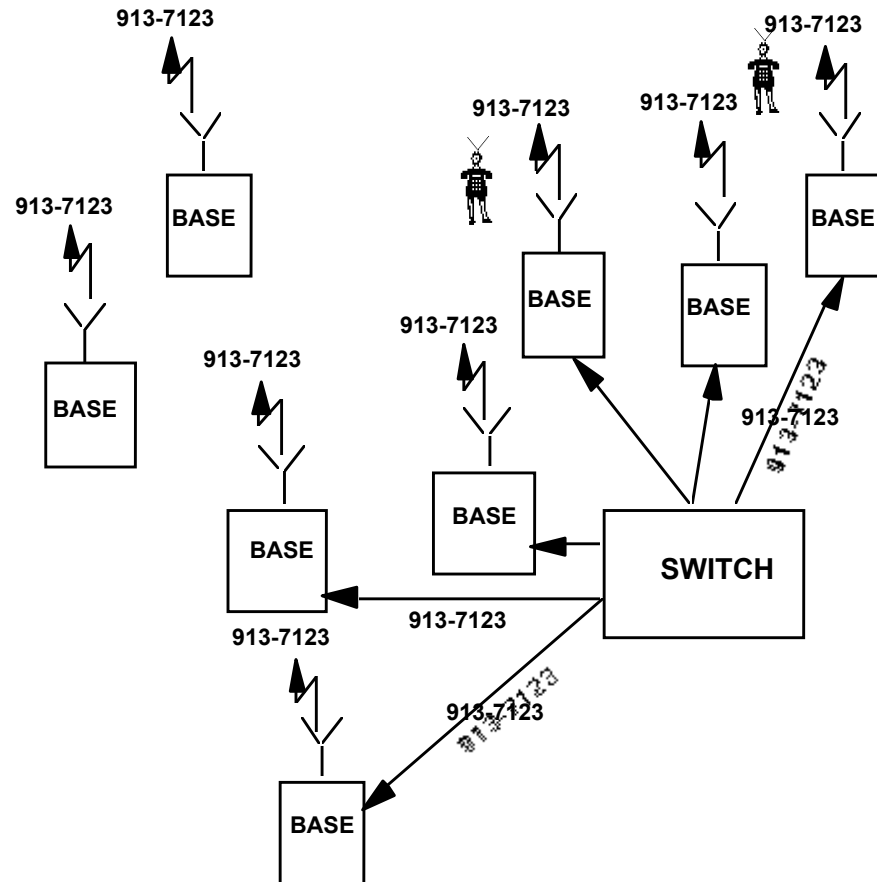
INITIALIZE CELLULAR PHONE



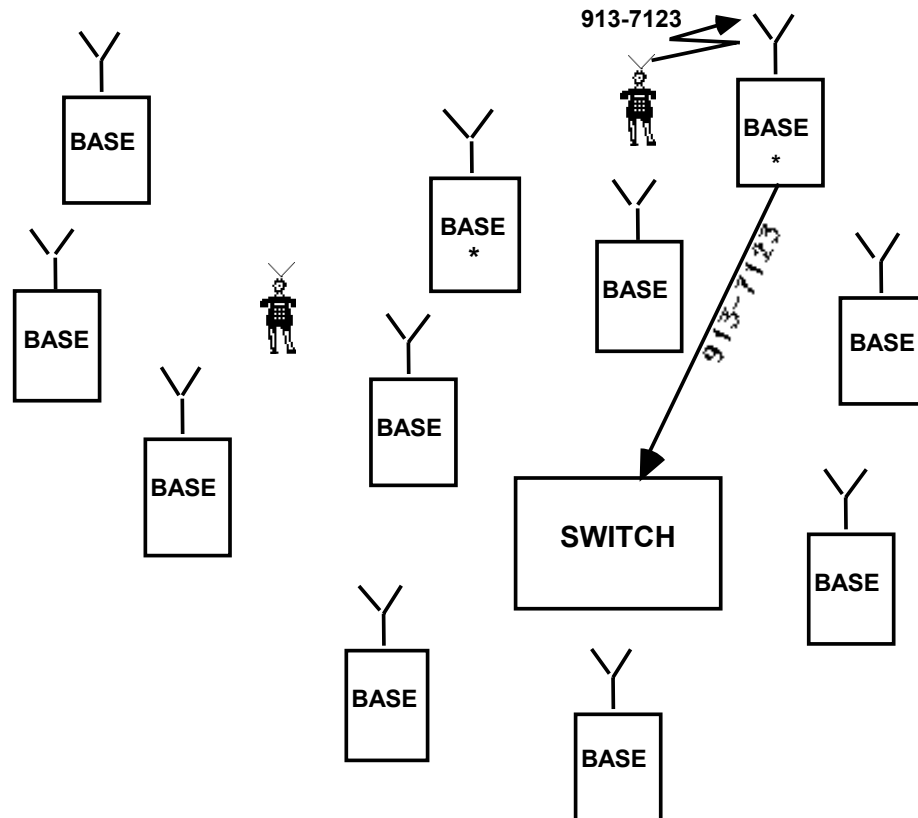
INITIATE PHONE CALL



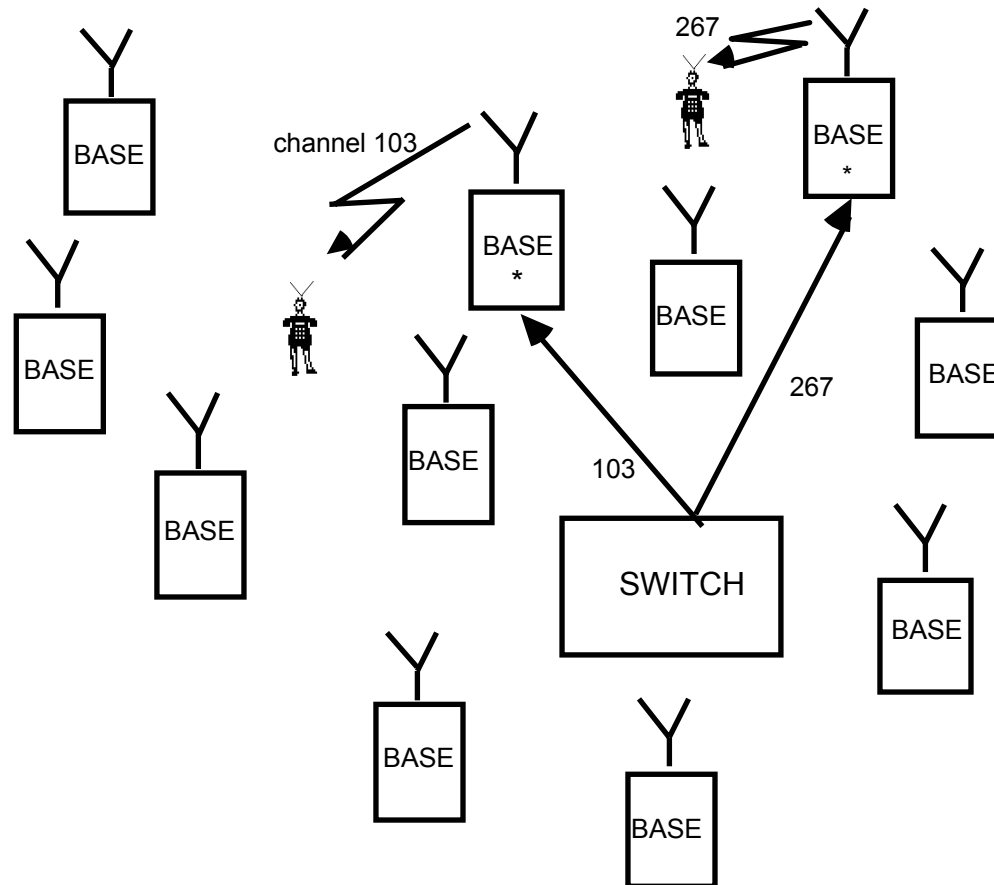
SEARCH FOR CELLULAR PHONE



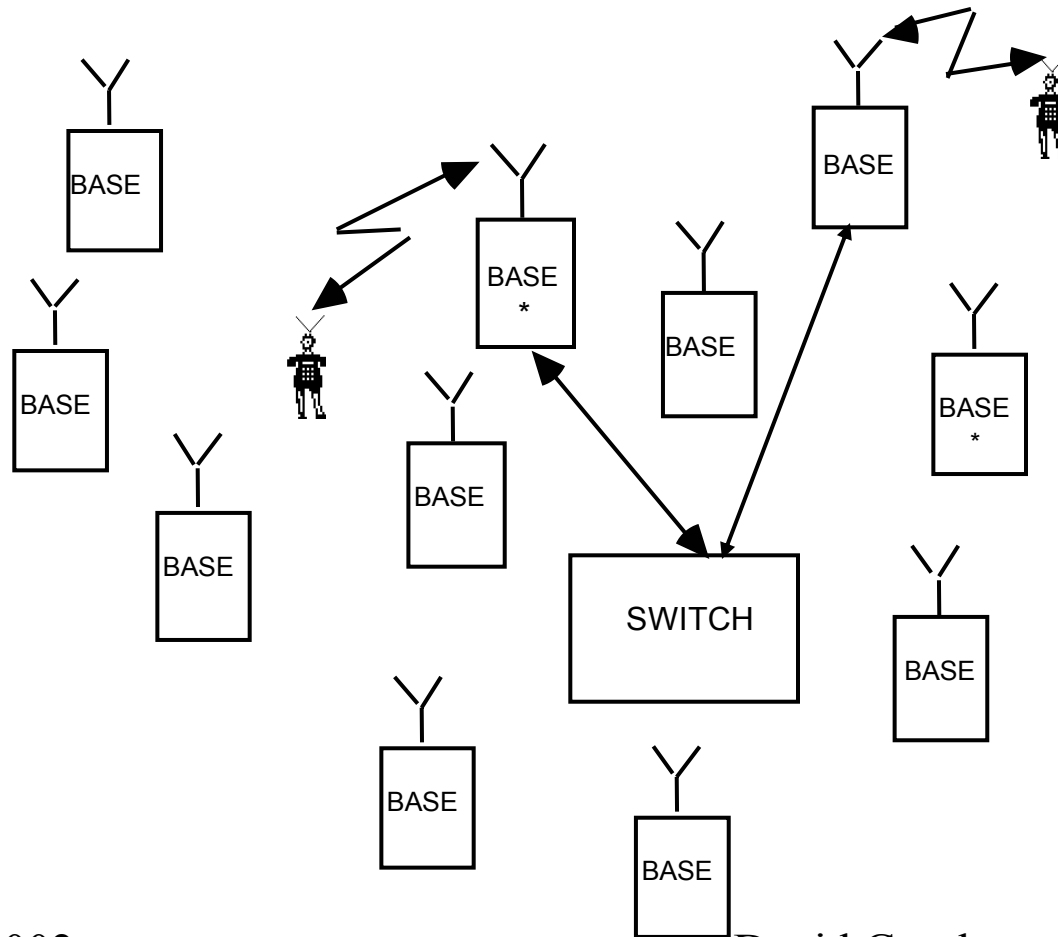
RESPOND TO PAGE MESSAGE



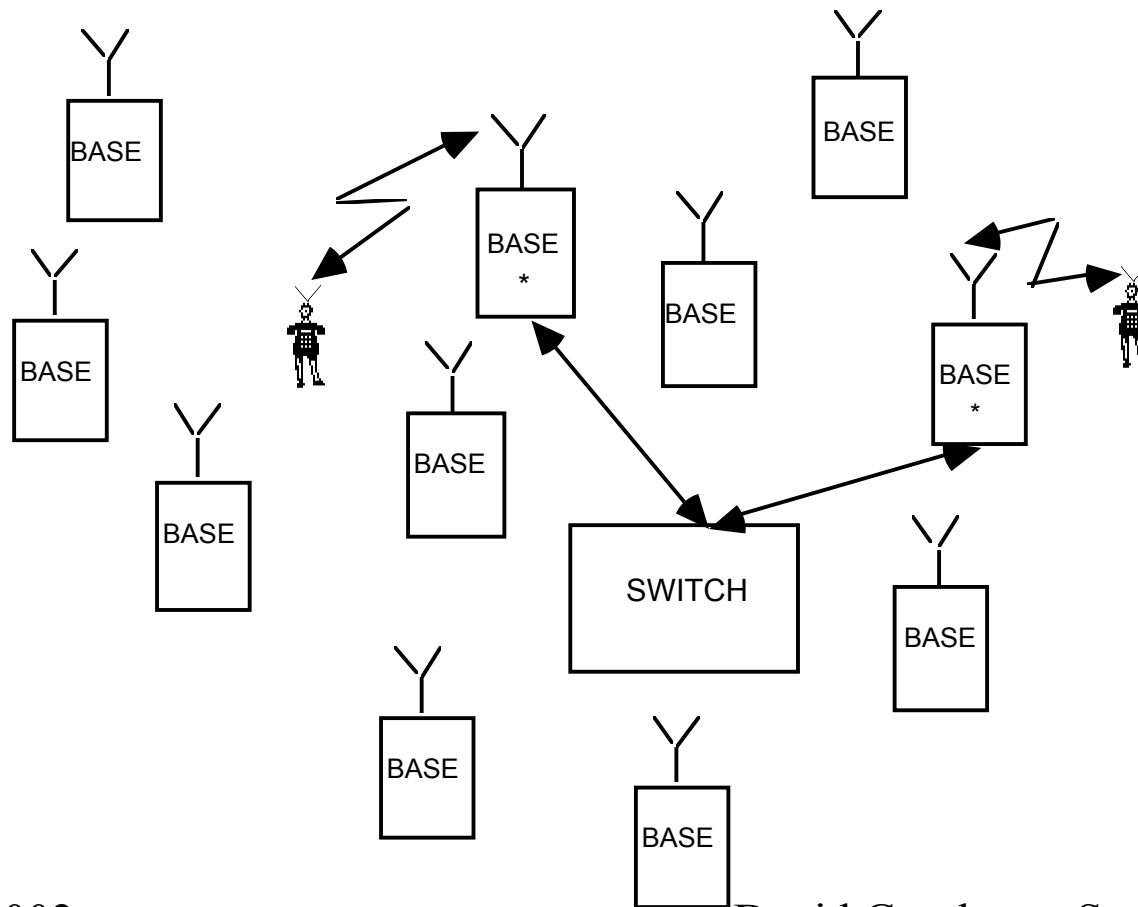
ASSIGN RADIO CHANNELS



CONVERSATION



HANDOFF



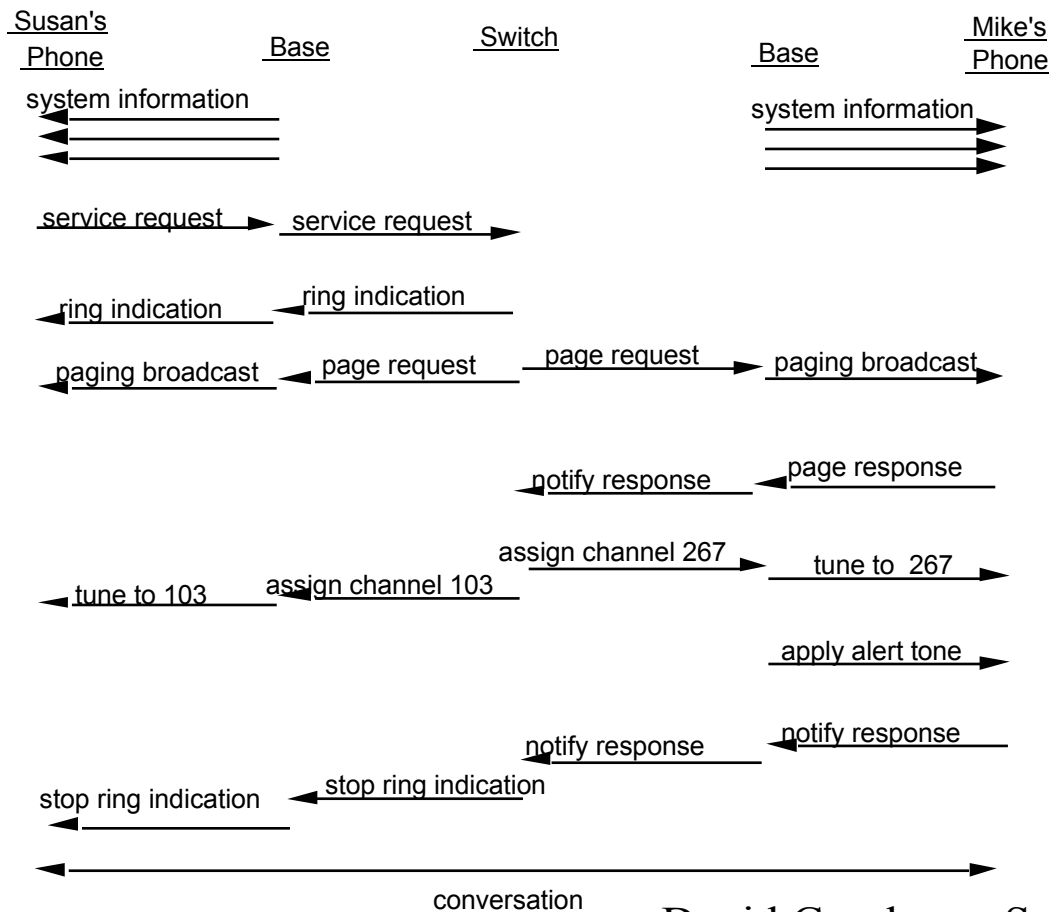
NETWORK ELEMENTS

TERMINALS

BASE STATION

SWITCH

INFORMATION TRANSFER



TECHNOLOGY CHALLENGES

MOBILITY

ETHER

ENERGY

NETWORK OPERATIONS

USER INFORMATION TRANSPORT

CALL CONTROL

MOBILITY MANAGEMENT

RADIO RESOURCE MANAGEMENT

SECURITY, PRIVACY

OPERATIONS, ADMINISTRATION & MAINTENANCE

WIRELESS SYSTEMS

CELLULAR

CORDLESS

SATELLITES

WIRELESS LOCAL AREA NETWORKS

WIRELESS PERSONAL AREA NETWORKS

WIRELESS LOCAL LOOPS

WIRELESS DATA

SPECIALIZED MOBILE RADIO

CELLULAR PHONES

1983: ANALOG - LOCAL

1991: DIGITAL - ROAMING

2000: ANYTIME, ANYWHERE
+ SHORT MESSAGES

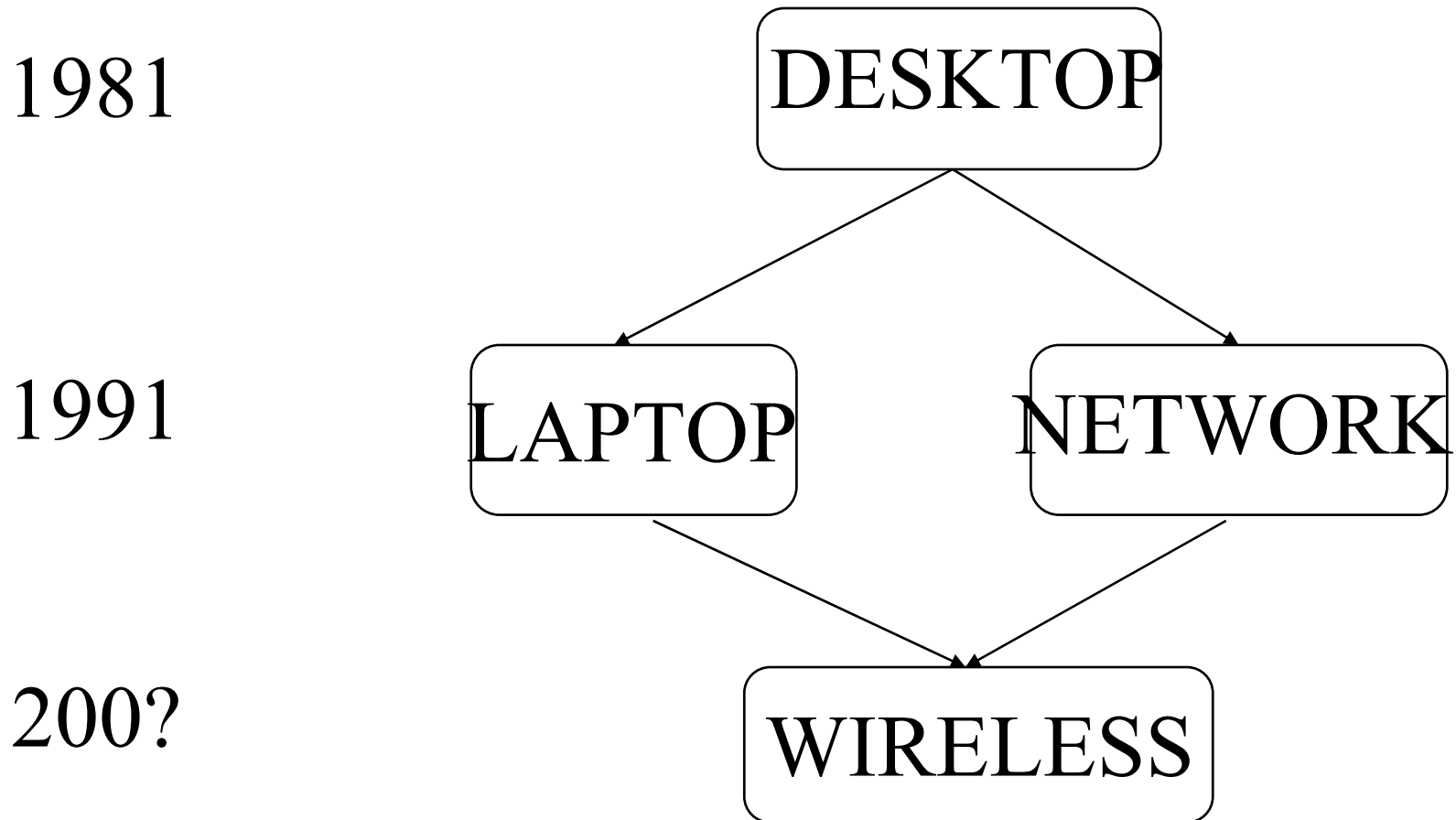
NEW CELLULAR TECHNOLOGY

PACKET DATA COMMUNICATIONS

IMPROVED BANDWIDTH EFFICIENCY

THIRD GENERATION SYSTEMS

PERSONAL COMPUTING

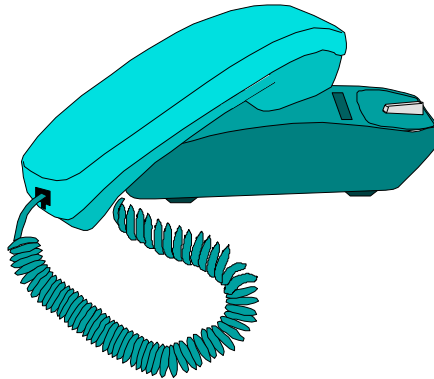


WIRELESS DATA

MOBILE WIRELESS COMPUTING

- SPEED 10 kb/s ☹
- COST 13 min/MB ☹
- POWER ☹
- APPLICATION/USER INTERFACE ☹

TELEPHONE (NON-CELLULAR) HASN'T CHANGED MUCH SINCE 1939



INFORMATION IN

sounds
switch hook
dial → **keypad**

INFORMATION OUT

sounds (3 kHz)

TELEPHONE NETWORK

LOTS OF CHANGE

MORE USERS 800,000,000 LINES

FASTER CONNECTIONS

CALLING FEATURES

COMPLEX BILLING

FEWER EMPLOYEES

TELEPHONE TECHNOLOGY

OPPOSITE OF COMPUTERS !!

SIMPLE TERMINAL

COMPLEX NETWORK

CIRCUIT SWITCHED

CENTRAL CONTROL

PRIMITIVE USER INTERFACE

CELLULAR PHONE

TELEPHONE

RADIO TRANSMITTER/RECEIVER

DATA MODEM

COMPUTER

PRACTICAL SYSTEMS

EUROPE: GSM 900, GSM 1800 → UMTS (3- G)

JAPAN: PDC, CDMA → W-CDMA (3- G)

NEW YORK CITY:

VERIZON: AMPS + CDMA 850

AT&T: AMPS + TDMA 850

SPRINT: CDMA 1900

VOICESTREAM: GSM 1900

NEXTEL: iDEN

TECHNOLOGY DETAILS

RADIO TRANSMISSION: MULTIPLE ACCESS

FREQUENCY DIVISION

TIME DIVISION

CODE DIVISION

MOBILITY MANAGEMENT

REGISTRATION

PAGING

RADIO RESOURCE MANAGEMENT

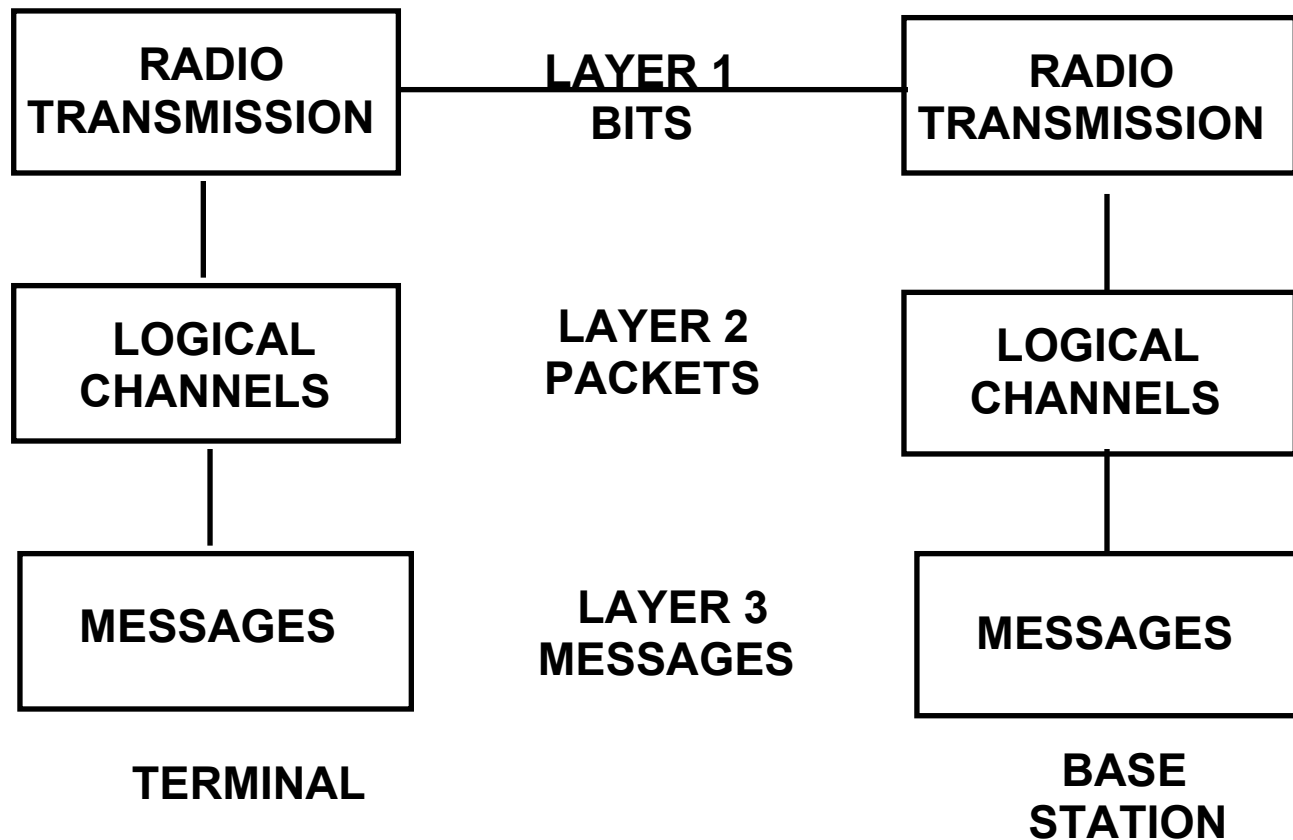
ADMISSION CONTROL

CHANNEL ALLOCATION

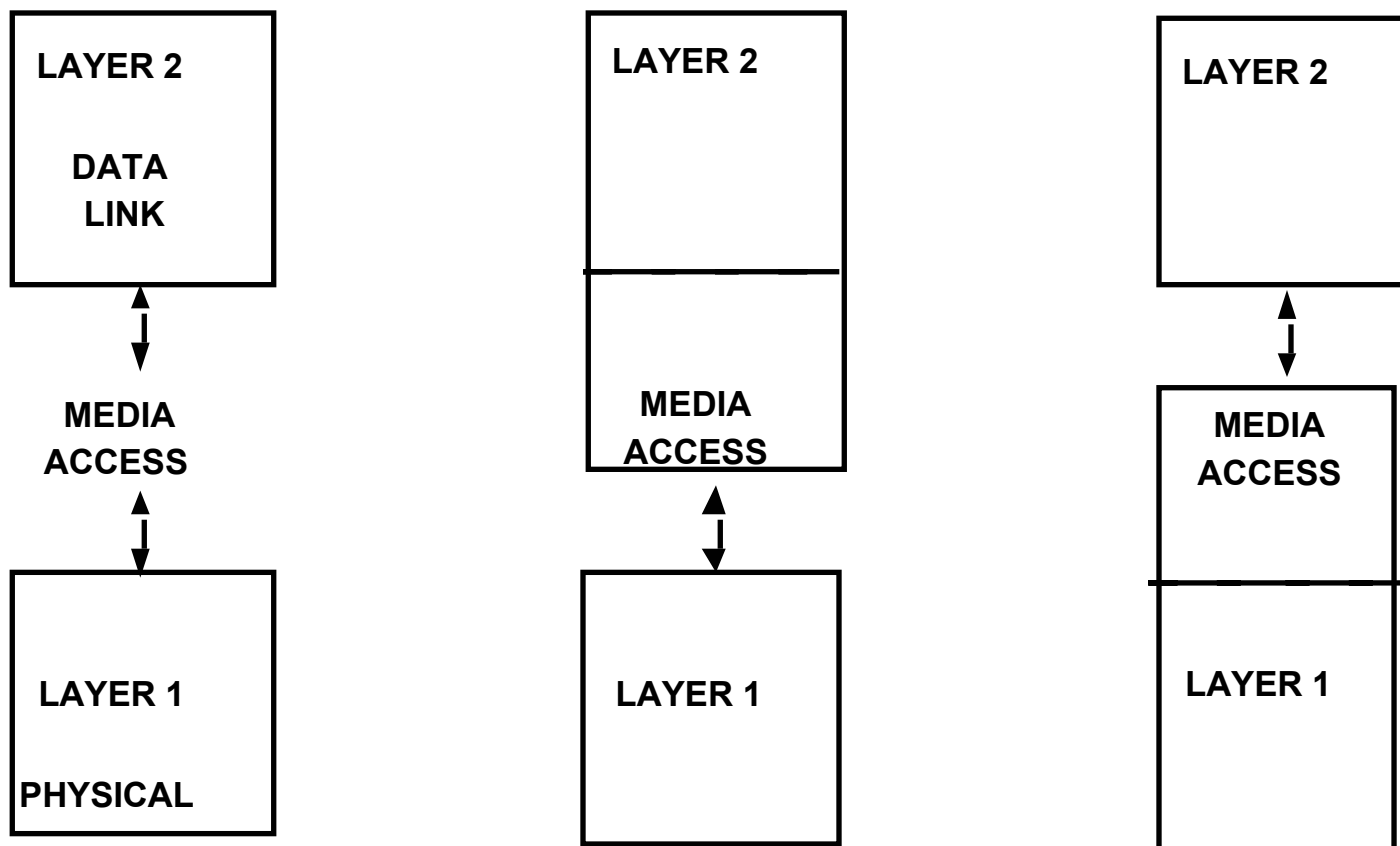
POWER CONTROL

HANDOFF

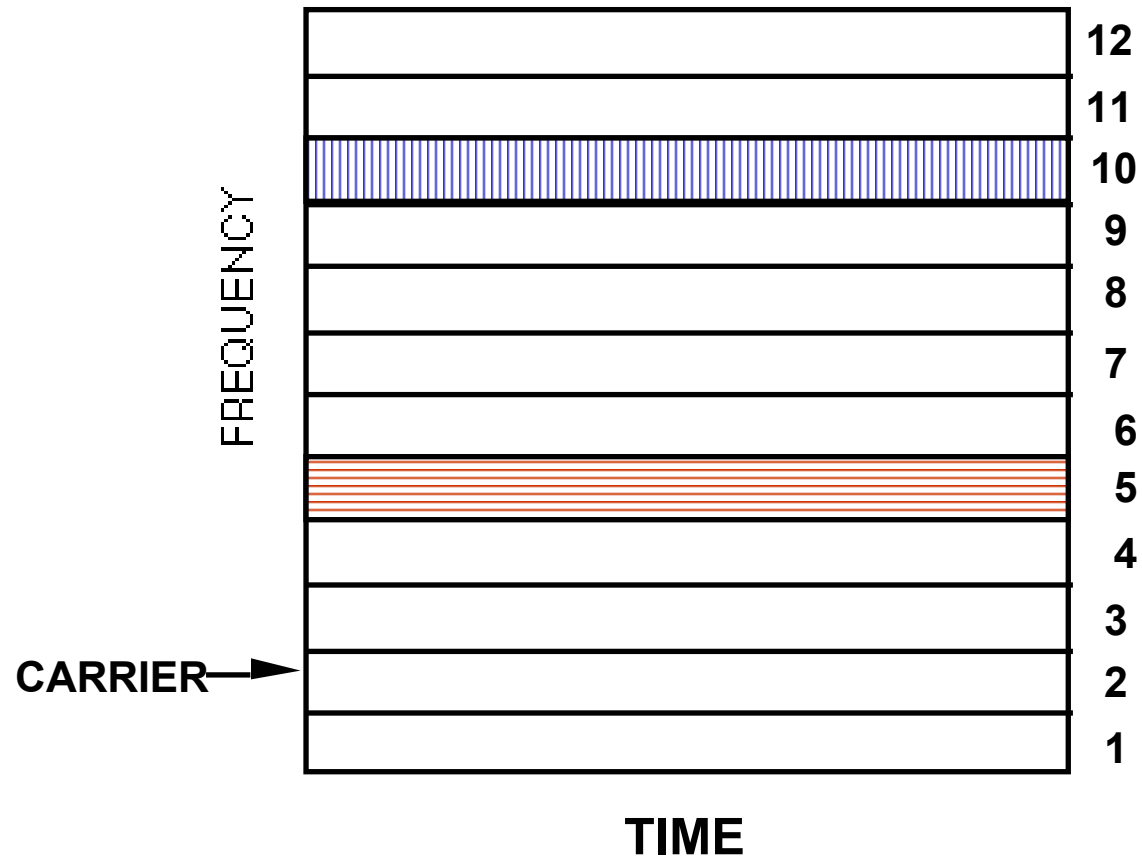
AIR INTERFACE PROTOCOLS



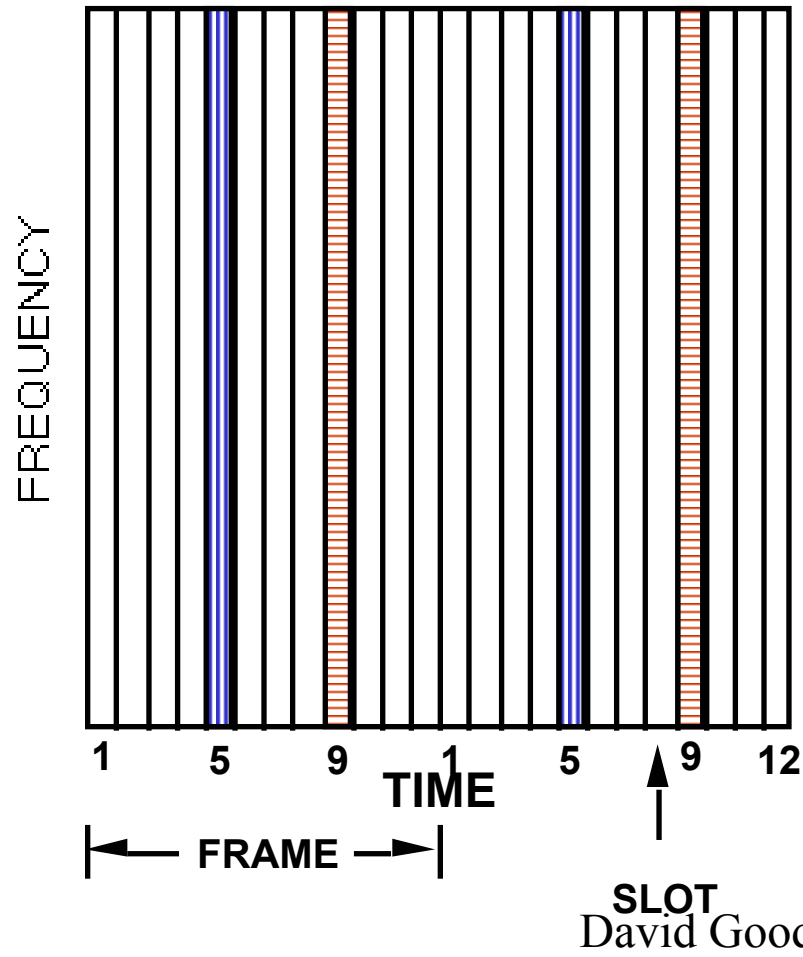
MEDIA ACCESS CONTROL LAYER



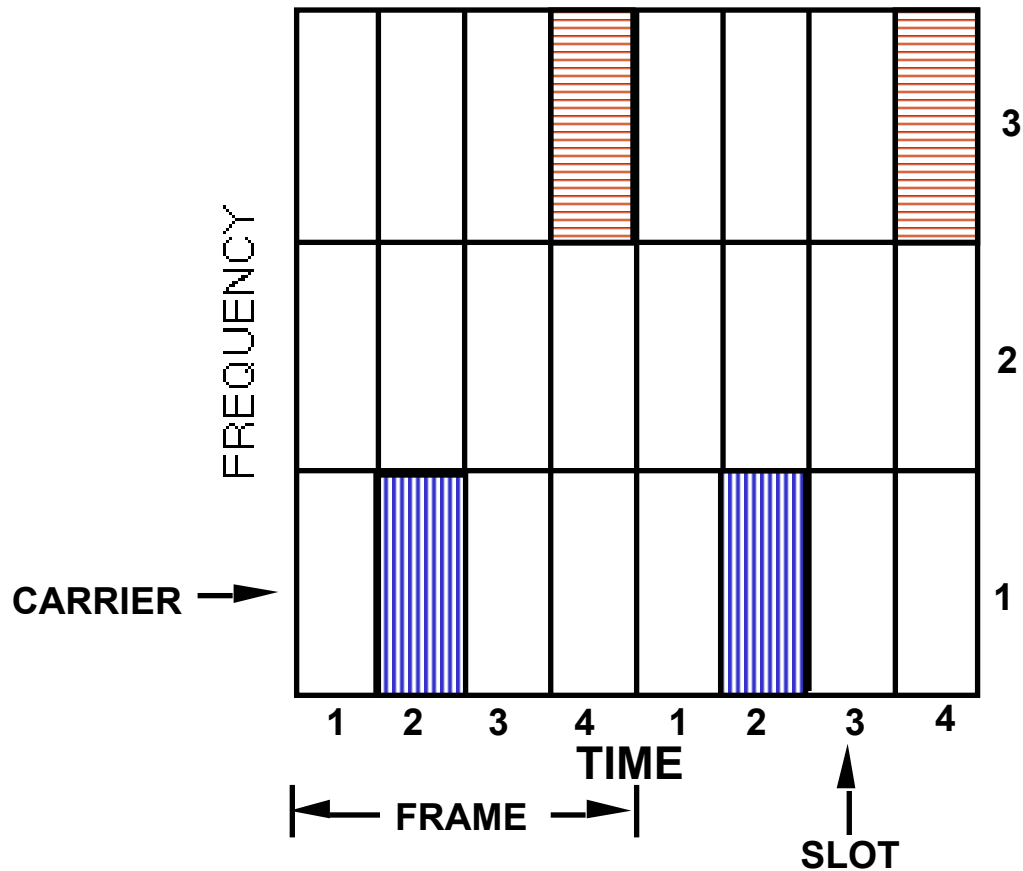
FREQUENCY DIVISION



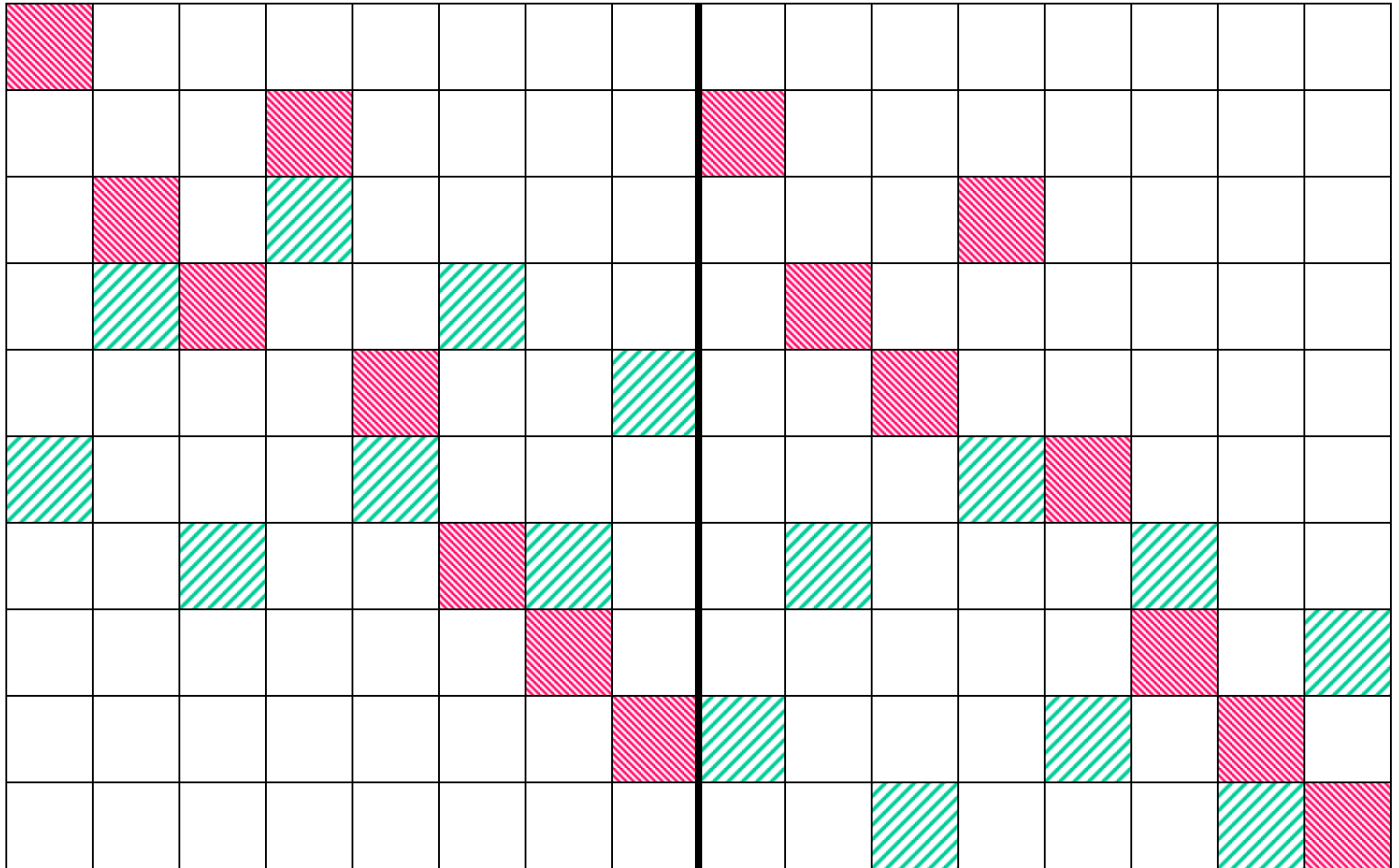
TIME DIVISION



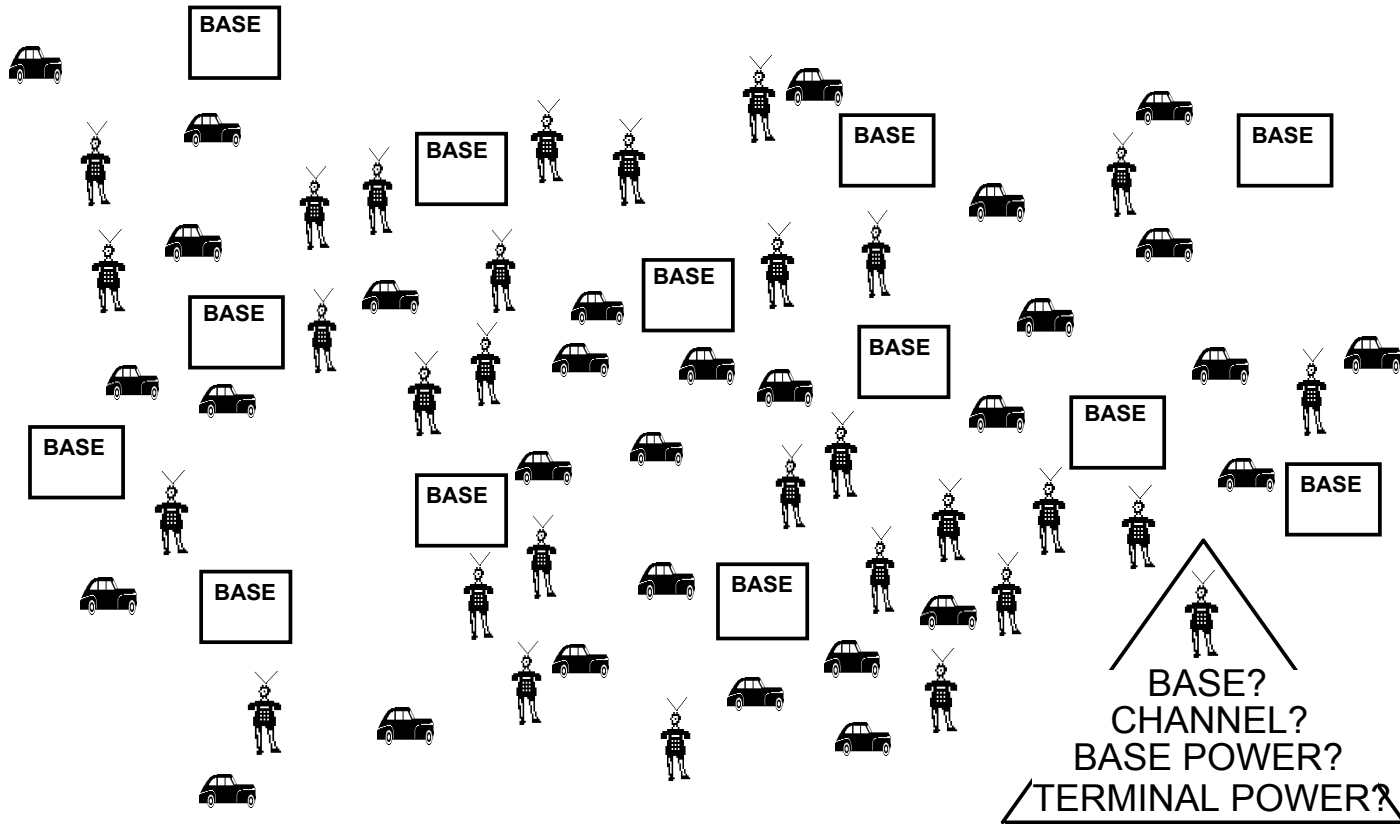
HYBRID



CODE DIVISION



RADIO RESOURCE MANAGEMENT



PRACTICAL STEPS IN RADIO RESOURCE MANAGEMENT

