Medidas sobre el sistema GSM

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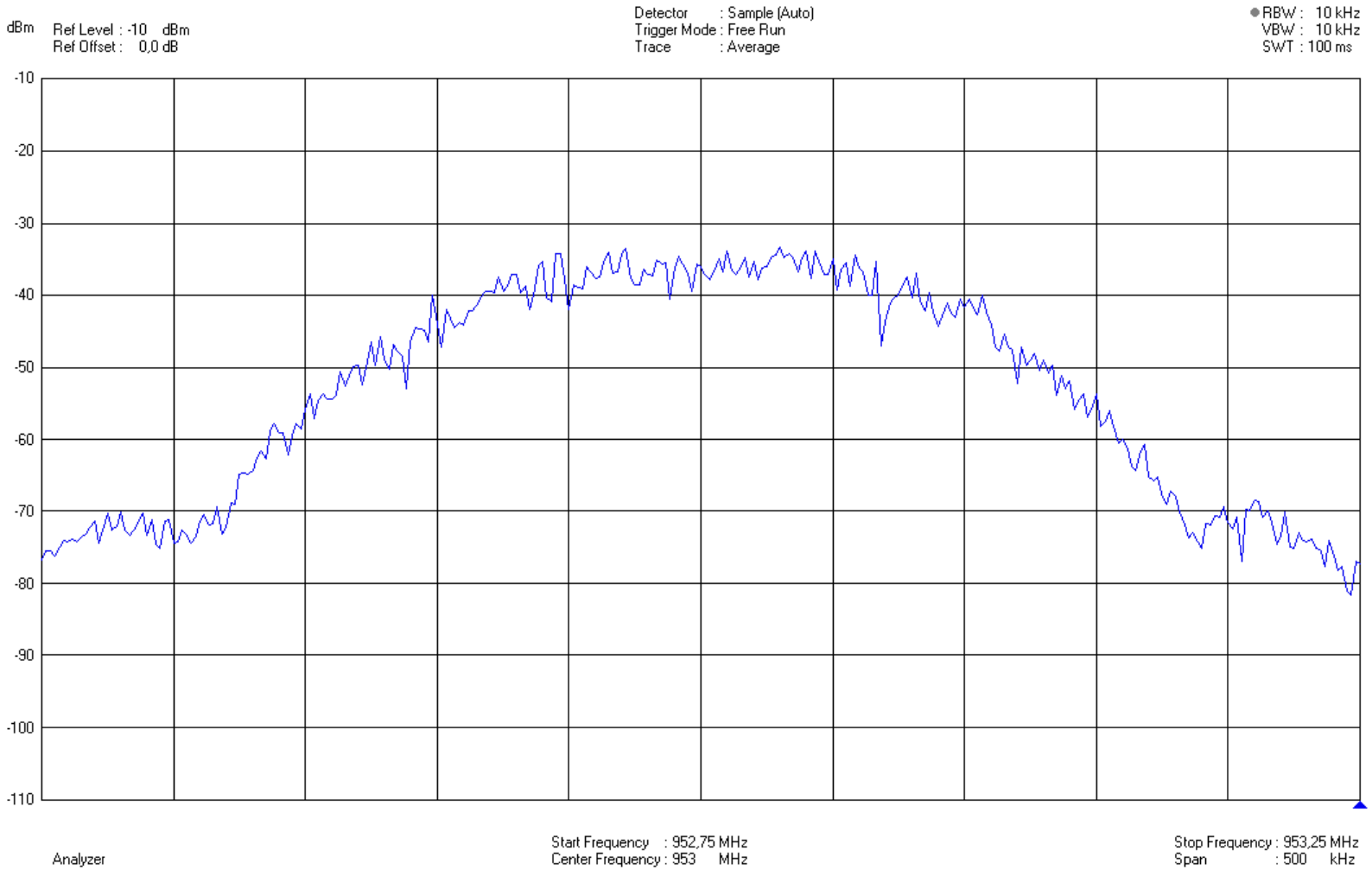
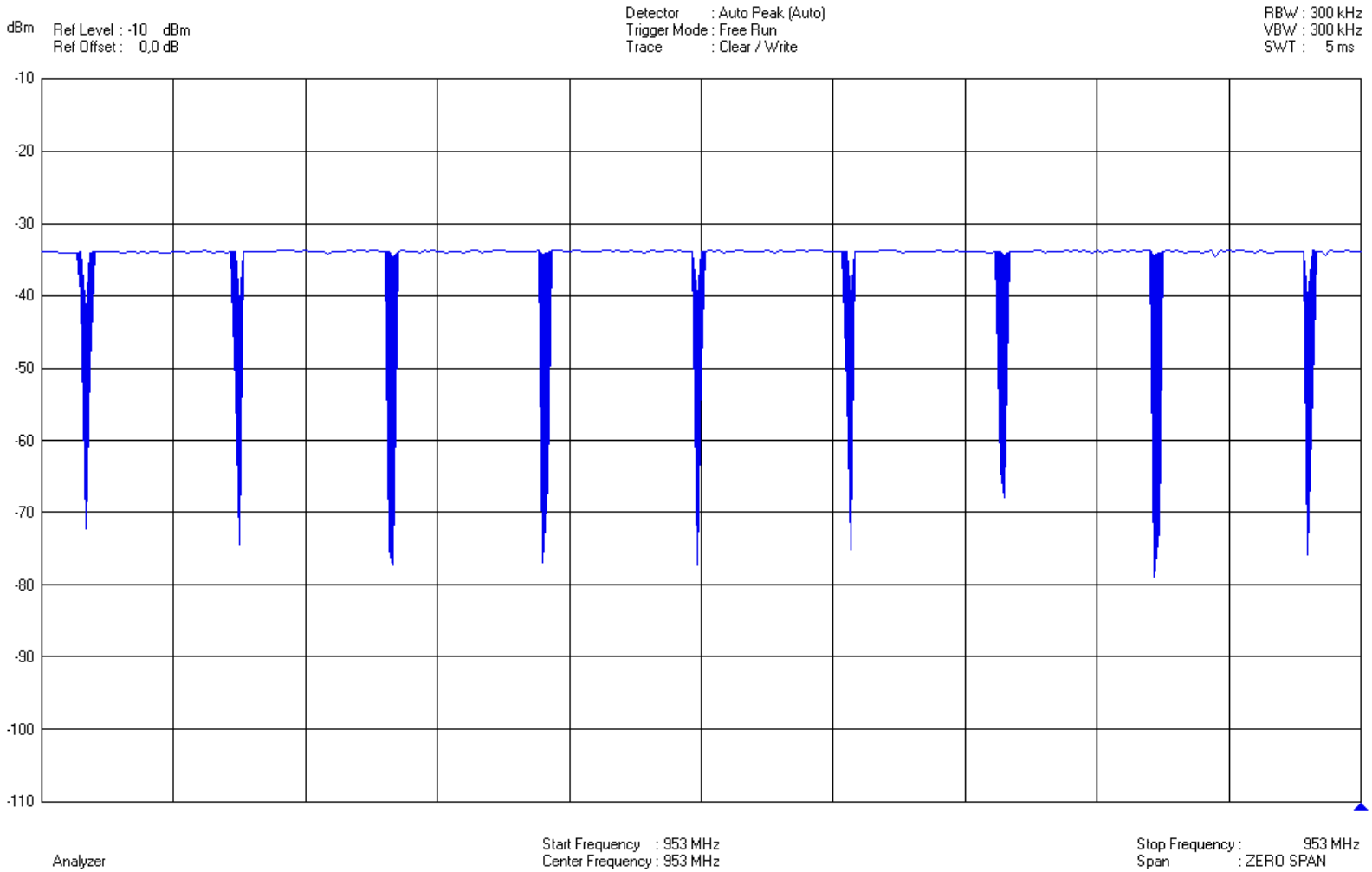
1. Analizador de espectros (dominios de la frecuencia y del tiempo)
2. Herramienta de monitorización de la interfaz radio (TEMS)

1. Analizador de espectros (dominios de la frecuencia y del tiempo)

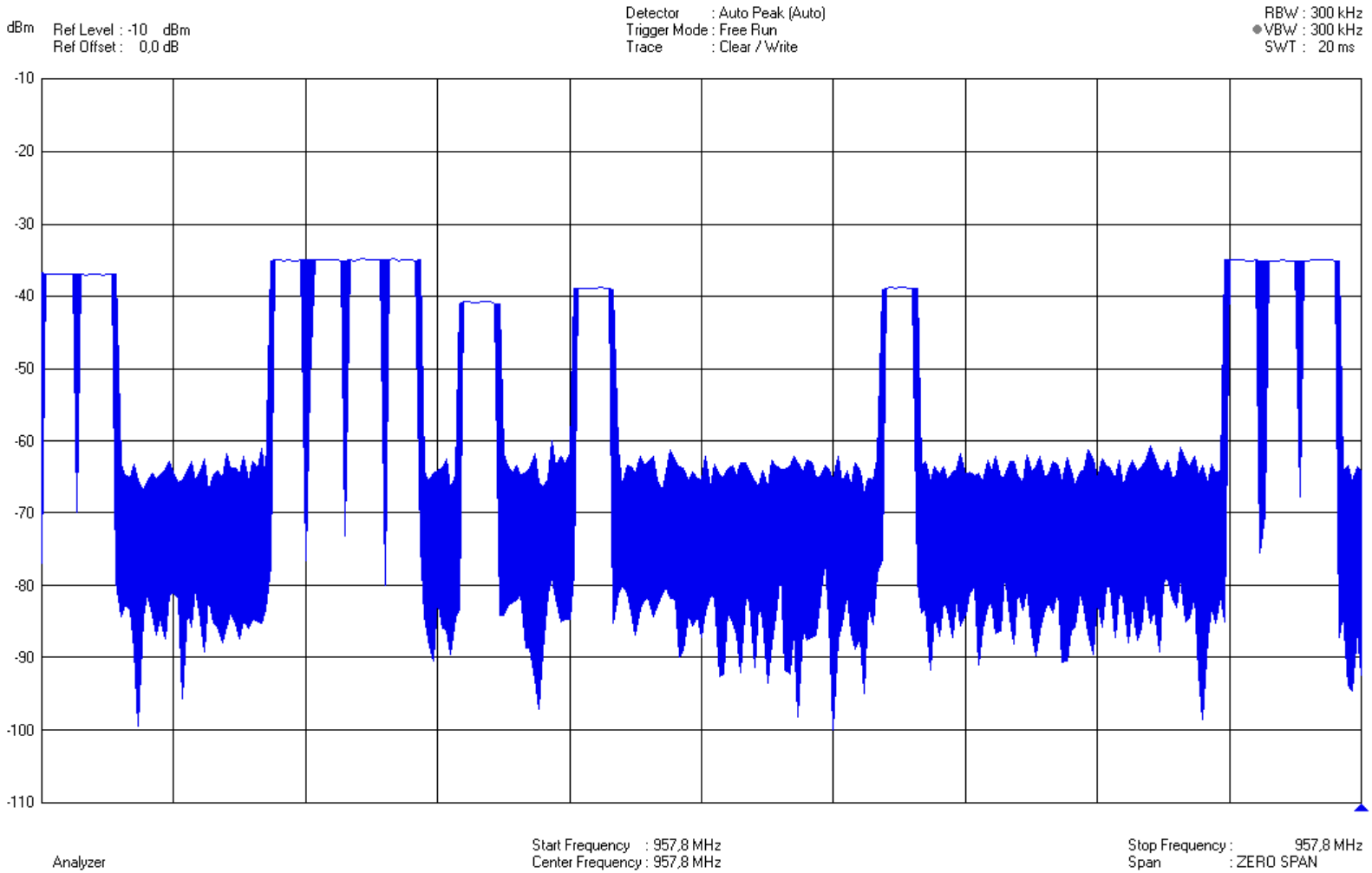
Espectro


dBm
Ref Level : -10 dBm
Ref Offset : 0,0 dB
Detector : Sample (Auto)
Trigger Mode : Free Run
Trace : Average
RBW : 10 kHz
VBW : 10 kHz
SWT : 100 ms
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
Analyzer
Start Frequency : 952,75 MHz
Center Frequency : 953 MHz
Stop Frequency : 953,25 MHz
Span : 500 kHz

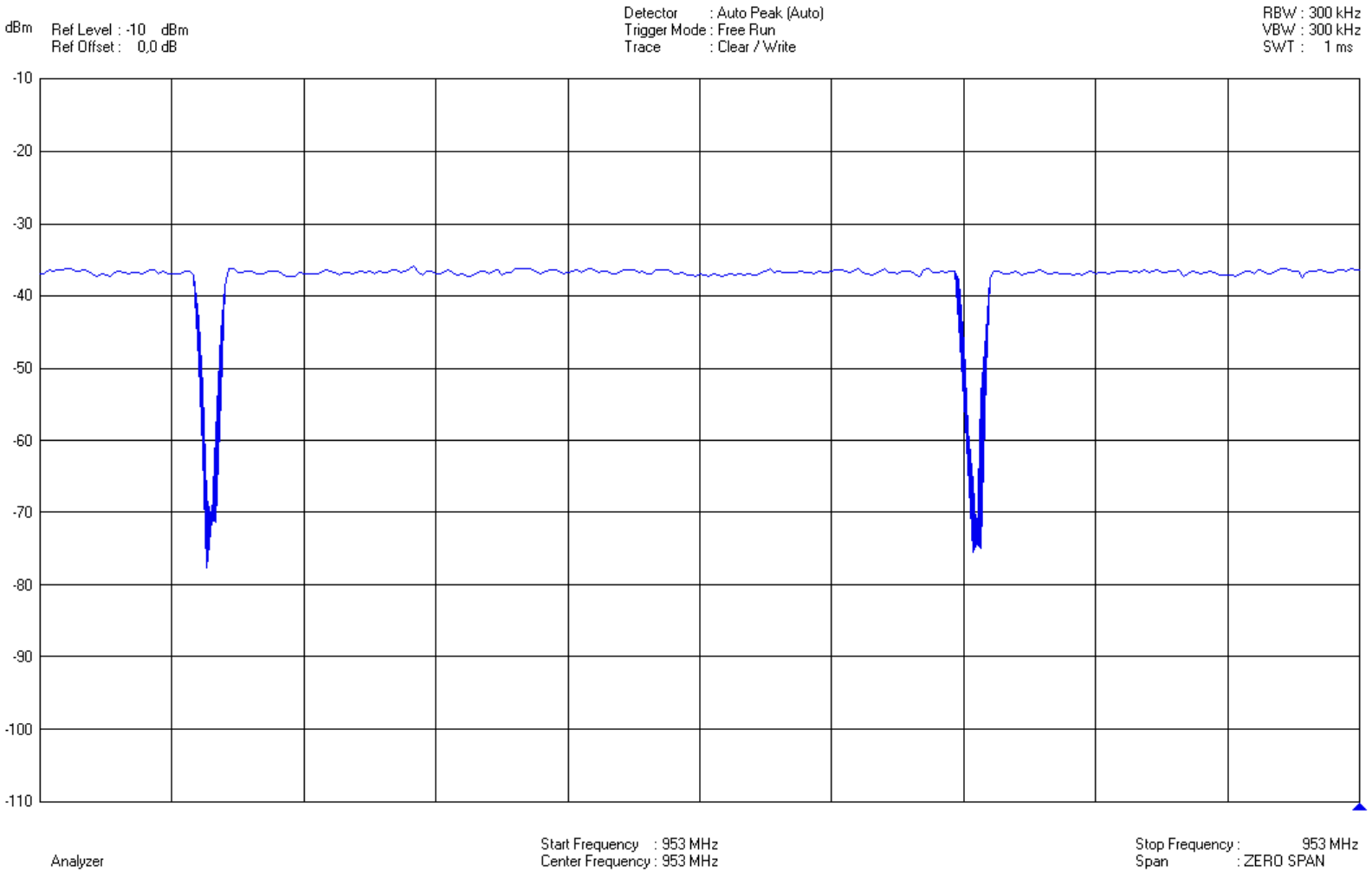
Trama, portadora baliza



Tramas, portadora no baliza

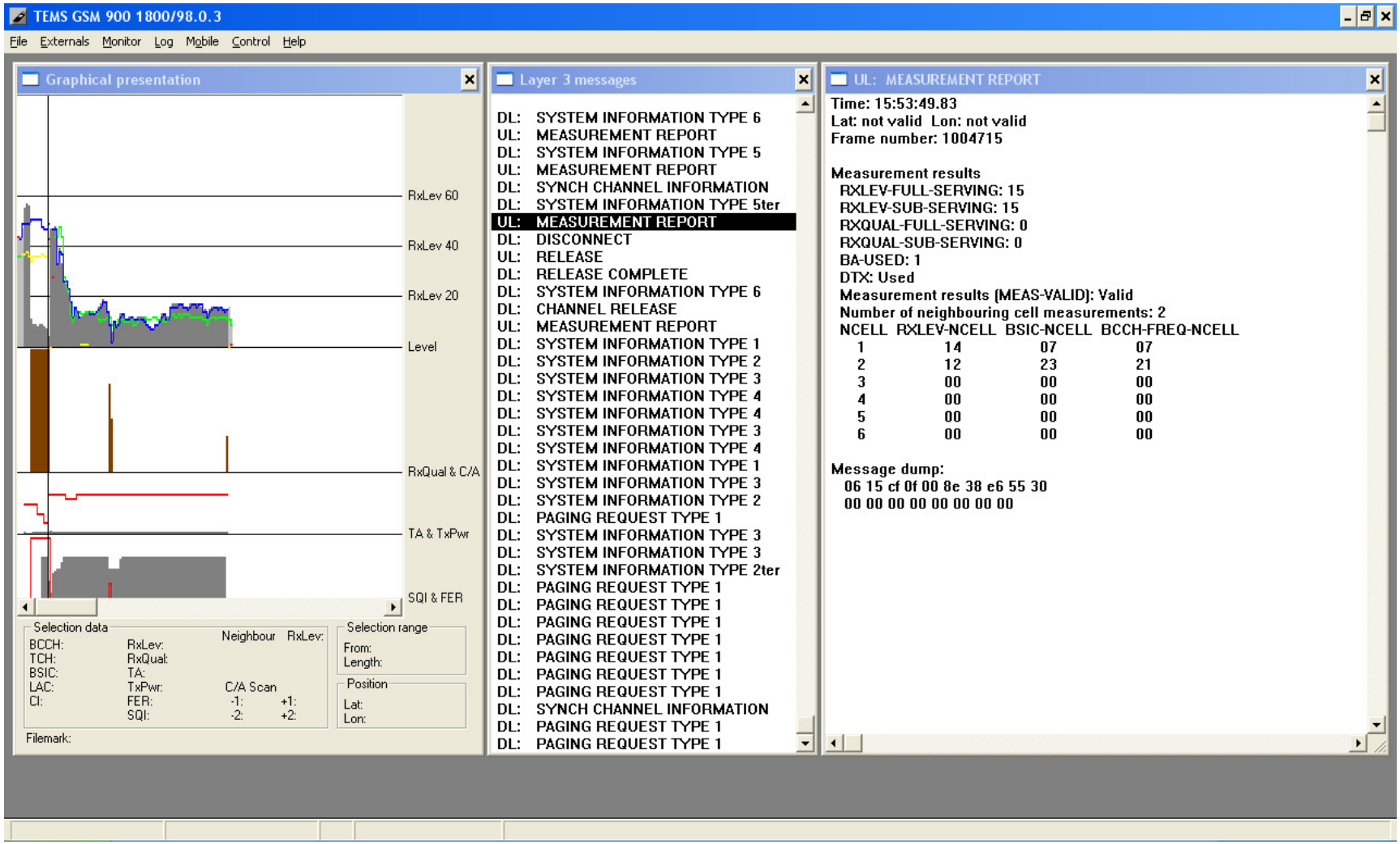


Intervalos, portadora baliza

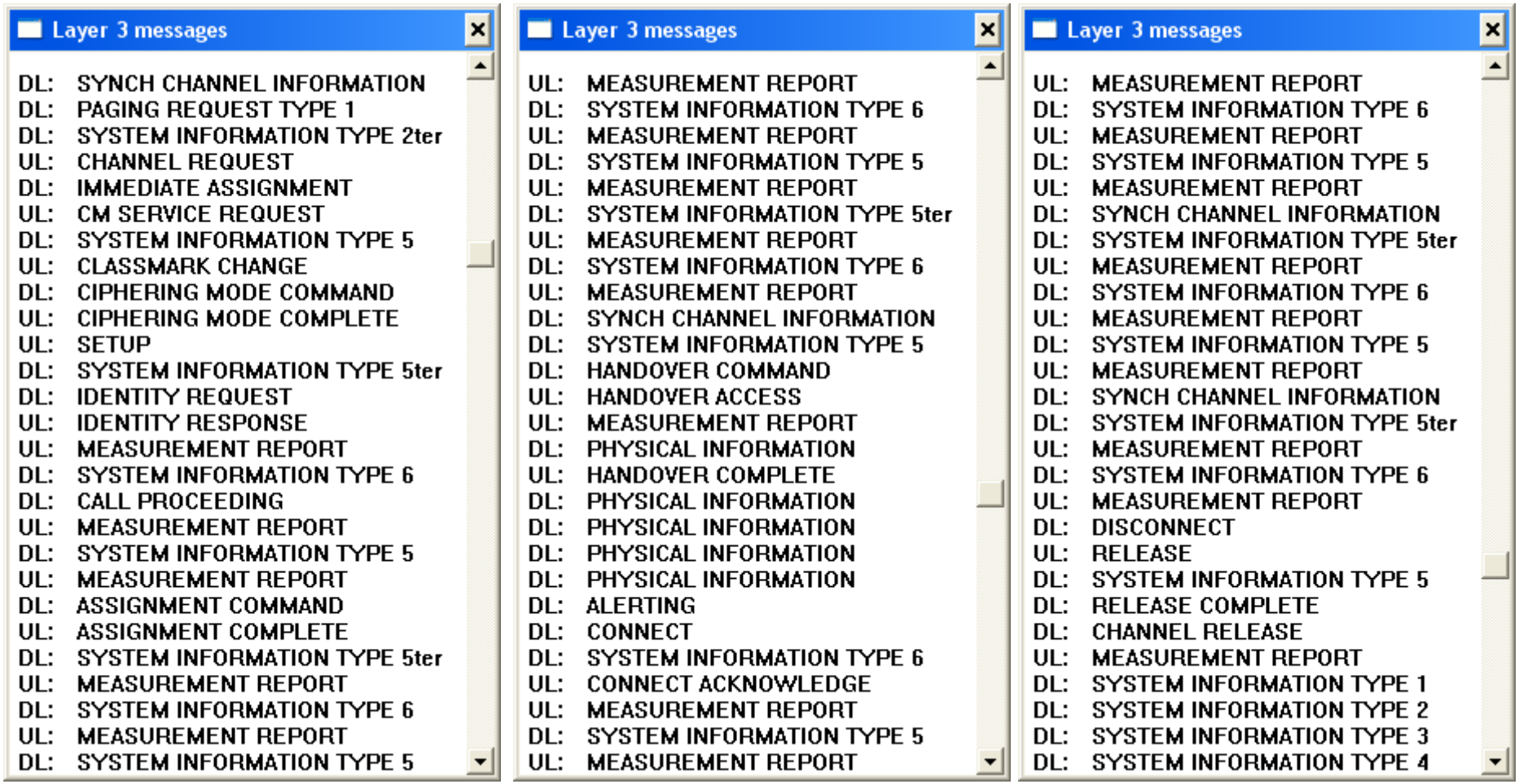


2. Herramienta de monitorización de la interfaz radio (TEMS)

Vista general de la herramienta



Mensajes (capa 3) durante una llamada



Mensajes en modo desocupado

DL: SYSTEM INFORMATION TYPE 1

Time: 14:41:33.87
Lat: not valid Lon: not valid
Frame number: 65290

Read from (ARFCN): 762
L2 Pseudo Length: 21
Cell channel description
  Cell Allocation
  Format notation: Variable bit map
  ARFCN:
    762
RACH control parameters
  Max retransmissions: 4
  Tx-integer: 12
  Cell bar access: Not barred
  Call reestablishment (RE): Not allowed
  Emergency call (EC) allowed: All MS
  Not barred class(es) (ACC): 0 1 2 3 4 5 6 7
                              8 9 11 12 13 14 15
SI 1 Rest Octets contains spare bits

Message dump:
  02 fa 55 06 19 8f 7d 00 00 00
  00 00 00 00 00 00 00 00 00 00
  00 a5 00 00 2b

DL: SYSTEM INFORMATION TYPE 2

Time: 14:41:34.11
Lat: not valid Lon: not valid
Frame number: 65341

Read from (ARFCN): 762
L2 Pseudo Length: 22
Neighbour cells description
  BA-IND: 0
  EXT-IND: 0
  BCCH Allocation
  Format notation: Variable bit map
  ARFCN:
    735 737 740 743 752 754 757 762 764 770
NCC permitted: 0 1 2 3 4 5 6 7
RACH control parameters
  Max retransmissions: 4
  Tx-integer: 12
  Cell bar access: Not barred
  Call reestablishment (RE): Not allowed
  Emergency call (EC) allowed: All MS
  Not barred class(es) (ACC): 0 1 2 3 4 5 6 7
                              8 9 11 12 13 14 15

Message dump:
  02 fa 59 06 1a 8f 6f a4 80 52
  14 10 00 00 00 00 00 00 00 00
  00 ff a5 00 00

DL: SYSTEM INFORMATION TYPE 2ter

Time: 14:41:36.92
Lat: not valid Lon: not valid
Frame number: 65951

Read from (ARFCN): 762
L2 Pseudo Length: 0
Neighbour cells description 2
  Multiband reporting: 2
  BA-IND: 0
  BCCH Allocation
  Format notation: Bit map 0
  ARFCN:
    65 66 67 68 69 70 72 73 74 75
    76 77 78 79 80 81 82 122 123 124
SI 2ter Rest Octets contains spare bits

Message dump:
  02 fa 01 06 03 4e 00 00 00 00
  03 ff bf 00 00 00 00 00 00 00
  00 2b 2b 2b 2b

Mensajes en modo desocupado

DL: SYSTEM INFORMATION TYPE 4

```
Time: 14:41:34.58
Lat: not valid  Lon: not valid
Frame number: 65443

Read from (ARFCN): 762
L2 Pseudo Length: 12
Location area identification
  Mobile country code (MCC): 214
  Mobile network code (MNC): 01
  Location area code (LAC): 469b (hex)
Cell selection parameters
  CELL-RESELECT HYSTERESIS: 8 dB RXLEV
  MS-TXPWR-MAX-CCH: 0
  ADDITIONAL RESELECT PARAM IND (ACS)
  The SI 4 rest octets, if present, shall be used to derive the
  value of PI and possibly C2 parameters and/or other parameters
  HALF RATE SUPPORT (NECI):
  New establishment causes are not supported
  RXLEV-ACCESS-MIN: 0
RACH control parameters
  Max retransmissions: 4
  Tx-integer: 12
  Cell bar access: Not barred
  Call reestablishment (RE): Not allowed
  Emergency call (EC) allowed: All MS
  Not barred class(es) (ACC): 0 1 2 3 4 5 6 7
                              8 9 11 12 13 14 15
SI 4 Rest Octets
  Cell Reselect Parameters Indication (PI): C2 Parameters present
  Cell Bar Qualify (CBQ): 0
  If Cell Bar Access = 0
    Cell Selection priority: Normal
    Status for cell reselection: Normal
  else
    Cell Selection priority: Barred
    Status for cell reselection: Barred
  Cell Reselection Offset: 0 dB
  Temporary Offset: 0 dB
  Penalty Time: 20 s
  Power Offset Indication (POI): Power Offset Parameter not present

Message dump:
   02 fa 31 06 1c 12 f4 10 46 9b
   80 00 a5 00 00 80 00 2b 2b 2b
   2b 2b 2b 2b 2b
```

DL: SYSTEM INFORMATION TYPE 3

```
Read from (ARFCN): 762
L2 Pseudo Length: 18
Cell Identity: 376c (hex)
Location area identification
  Mobile country code (MCC): 214
  Mobile network code (MNC): 01
  Location area code (LAC): 469b (hex)
Control channel description
  Attach/detach allowed (ATT): Yes
  BS-AG-BLKS-RES: 1
  CCCH-CONF: 1 basic physical channel, not combined with SDCCH's
  BS-PA-MFRMS: 5 multiframes period
  T3212 timeout value: 20
Cell options(BCCH)
  Power control indicator (PWRC): Not set
  DTX indicator: MS shall use uplink discontinuous transmission
  RADIO-LINK-TIMEOUT: 16
Cell selection parameters
  CELL-RESELECT HYSTERESIS: 8 dB RXLEV
  MS-TXPWR-MAX-CCH: 0
  RXLEV-ACCESS-MIN: 0
RACH control parameters
  Max retransmissions: 4
  Tx-integer: 12
  Cell bar access: Not barred
  Call reestablishment (RE): Not allowed
  Emergency call (EC) allowed: All MS
  Not barred class(es) (ACC): 0 1 2 3 4 5 6 7
                              8 9 11 12 13 14 15
SI 3 Rest Octets
  Cell Reselect Parameters Indication (PI): C2 Parameters present
  Cell Bar Qualify (CBQ): 0
  If Cell Bar Access = 0
    Cell Selection priority: Normal
    Status for cell reselection: Normal
  else
    Cell Selection priority: Barred
    Status for cell reselection: Barred
  Cell Reselection Offset: 0 dB
  Temporary Offset: 0 dB
  Penalty Time: 20 s
  Power Offset Indication (POI): Power Offset Parameter not present
 Early Sending: Explicity accepted
 System Information 2ter: Available
```

Asignación de canal. Informe de medidas

DL: IMMEDIATE ASSIGNMENT

Time: 14:41:24.57
Lat: not valid Lon: not valid
Frame number: 2708631

L2 Pseudo Length: 12
Page mode: Extended paging
Channel description
  Channel type: SDCCH/8 + SACCH/C8 or CBCH (SDCCH/8)
  Subchannel number: 4
  Timeslot number (TN): 1
  Training sequence code (TSC): 3
  Hopping channel: RF hopping channel
  Mobile allocation index offset (MAIO): 0
  Hopping sequence number (HSN): 55
Request reference 1
  Establish cause (RA): Answer to paging
  Random reference (RA): 2
  T1': 26
  T2: 0
  T3: 43
Timing advance value: 0
Mobile allocation: 2 3
IA Rest Octets (Frequency parameters, before time)
IA Rest Octets contains spare bits

Message dump:
  01 31 06 3f 01 61 70 37 82 d5
  60 00 01 06 2b 2b 2b 2b 2b 2b
  2b 2b 2b 2b

UL: MEASUREMENT REPORT

Time: 14:41:25.49
Lat: not valid Lon: not valid
Frame number: 2708831

Measurement results
  RXLEV-FULL-SERVING: 55
  RXLEV-SUB-SERVING: 55
  RXQUAL-FULL-SERVING: 0
  RXQUAL-SUB-SERVING: 0
  BA-USED: 0
  DTX: Not used
  Measurement results (MEAS-VALID): Valid
  Number of neighbouring cell measurements: 4

NCELL	RXLEV-NCELL	BSIC-NCELL	BCCH-FREQ-NCELL
1	41	07	21
2	40	16	02
3	33	23	06
4	31	17	01
5	00	00	00
6	00	00	00

Message dump:
  06 15 37 37 01 29 a8 f4 08 e8
  4c 9b e1 3c 00 00 00 00