Service Equipment

Ericsson Handheld Telephone 1341-B

Contents

The type of equipment required for service on the ***Ericsson Handheld Telephone 1341-B*** includes instruments, tools, and other hardware, but also frequency tables and programs for test, NAM programming, ESN transfer and software upgrading. The tables, and descriptions of the programs are included as Appendices A, B, C, D, E and F in this chapter.

Recommended Service Equipment

Instruments

Table 1

Instrument	Recommended Unit
Alternative 1:	
Radio Test System	Marconi 2960
Alternative 2:	
Communications Test Set	Schlumberger 4031
Alternative 3:	
Communications Test Set	Schlumberger 4015
Alternative 4:	
Radio Test Set	Rohde & Schwarz CMS 52
Signalling Unit	Rohde & Schwarz CMS-B13
All alternatives:	
Oscilloscope	Tektronix 2235
Multimeter	Hewlett-Packard 3468A
Digital Voltmeter	Fluke 8060A
Power Supply Unit	Power Box EK030-10

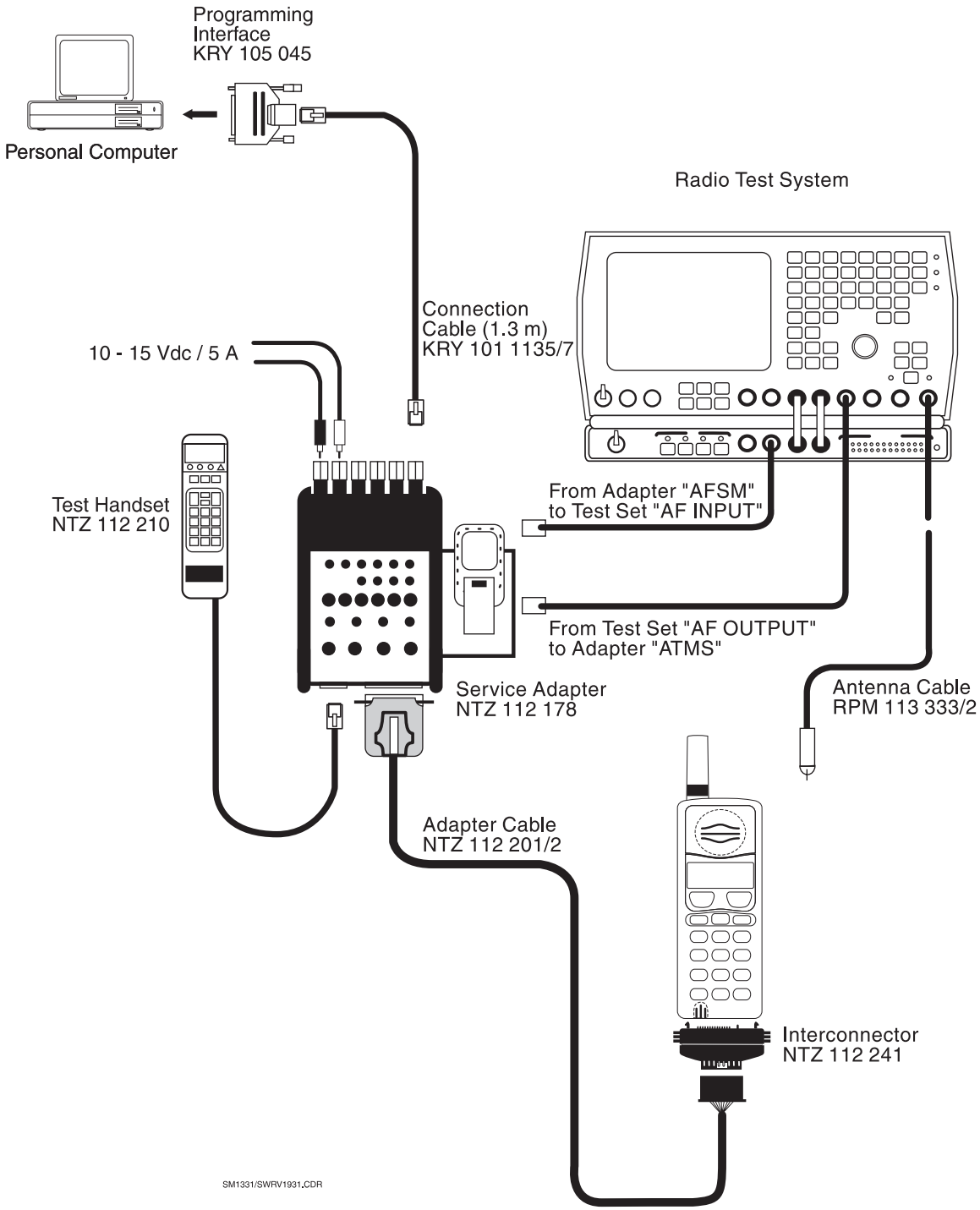


Figure 1. Service Equipment

Other Equipment

Table 2

Equipment	Ordering Number	Note
Personal Computer (*IBM PC/XT/AT* Compatible) **Service Program**		
ETACS Products	NTZ 112 180/4	
Programming Interface	KRY 105 045	
Connection Cable	KRY 101 1135/7	1.3 m.
Service Adapter	NTZ 112 178	
Test Handset	NTZ 112 211	
Adapter Cable	NTZ 112 201/2	
Interconnector	NTZ 112 241	
Programming Cable	KRY 101 1135/7	
Antenna Cable	RPM 113 333/2	
Torque Drive	NTZ 112 287	
Torque Bit	NTZ 112 288	

It is assumed that normal tools and soldering equipment are also available.

Note: *When servicing mobile telephones, it is important to use a bench earthing network to protect sensitive components against electrostatic charges (ESD).*

Service Program ETACS

The use of the service program is ***described in Appendix C, The Service Program ETACS.***

Test Handset

The built-in test program can be activated and run by a special control unit, the ***Test Handset***, or directly from the telephone. The *Test Program Entry* function must be enabled for accessing the test program directly from the telephone keypad.

Service Adapter

The *Service Adapter* is used in testing and repairing mobile telephones on the service bench. It enables you to supply the mobile station with power and to have certain functions displayed for control.

Appendix A: Frequency Tables

Contents

Frequency Tables for the ETACS System

A mobile telephone for the ETACS system operates in full duplex and provides 1320 channels with a channel spacing of 25 kHz (0.025 MHz) and a duplex separation of 45 MHz. The 900 MHz band has been divided into an upper and a lower band. The lower sub-band, 872.0125 - 904.9875 MHz, covers the 1320 transmitting channels in the handheld telephone, while the upper sub-band, 917.0125 - 949.9875 MHz, covers the corresponding 1320 receiving channels. The channels are numbered from 1329 to 2047 and from 0 to 600.

The following formulas can be used to calculate the frequencies (f, MHz) associated with a certain channel number (N = channel number).

Frequencies, channels 1329 - 2047 (see table 1):

$f_{Tx} = 872.0125 + (N-1329) * 0.025$ MHz
$f_{Rx} = 917.0125 + (N-1329) * 0.025$ MHz

Frequencies, channels 0 - 600 (see table 2):

$f_{Tx} = 889.9875 + N * 0.025$ MHz
$f_{Rx} = 934.9875 + N * 0.025$ MHz

Table 1. Frequency Table for ETACS, Channels 1329 - 1478

Ch.	Tx	Rx	Ch.	Tx	Rx	Ch.	Tx	Rx
1329	872.0125	917.0125	**1379**	873.2625	918.2625	**1429**	874.5125	919.5125
1330	872.0375	917.0375	**1380**	873.2875	918.2875	**1430**	874.5375	919.5375
1331	872.0625	917.0625	**1381**	873.3125	918.3125	**1431**	874.5625	919.5625
1332	872.0875	917.0875	**1382**	873.3375	918.3375	**1432**	874.5875	919.5875
1333	872.1125	917.1125	**1383**	873.3625	918.3625	**1433**	874.6125	919.6125
1334	872.1375	917.1375	**1384**	873.3875	918.3875	**1434**	874.6375	919.6375
1335	872.1625	917.1625	**1385**	873.4125	918.4125	**1435**	874.6625	919.6625
1336	872.1875	917.1875	**1386**	873.4375	918.4375	**1436**	874.6875	919.6875
1337	872.2125	917.2125	**1387**	873.4625	918.4625	**1437**	874.7125	919.7125
1338	872.2375	917.2375	**1388**	873.4875	918.4875	**1438**	874.7375	919.7375
1339	872.2625	917.2625	**1389**	873.5125	918.5125	**1439**	874.7625	919.7625
1340	872.2875	917.2875	**1390**	873.5375	918.5375	**1440**	874.7875	919.7875
1341	872.3125	917.3125	**1391**	873.5625	918.5625	**1441**	874.8125	919.8125
1342	872.3375	917.3375	**1392**	873.5875	918.5875	**1442**	874.8375	919.8375
1343	872.3625	917.3625	**1393**	873.6125	918.6125	**1443**	874.8625	919.8625
1344	872.3875	917.3875	**1394**	873.6375	918.6375	**1444**	874.8875	919.8875
1345	872.4125	917.4125	**1395**	873.6625	918.6625	**1445**	874.9125	919.9125
1346	872.4375	917.4375	**1396**	873.6875	918.6875	**1446**	874.9375	919.9375
1347	872.4625	917.4625	**1397**	873.7125	918.7125	**1447**	874.9625	919.9625
1348	872.4875	917.4875	**1398**	873.7375	918.7375	**1448**	874.9875	919.987
1349	872.5125	917.5125	**1399**	873.7625	918.7625	**1449**	875.0125	920.0125
1350	872.5375	917.5375	**1400**	873.7875	918.7875	**1450**	875.0375	920.0375
1351	872.5625	917.5625	**1401**	873.8125	918.8125	**1451**	875.0625	920.0625
1352	872.5875	917.5875	**1402**	873.8375	918.8375	**1452**	875.0875	920.0875
1353	872.6125	917.6125	**1403**	873.8625	918.8625	**1453**	875.1125	920.1125
1354	872.6375	917.6375	**1404**	873.8875	918.8875	**1454**	875.1375	920.1375
1355	872.6625	917.6625	**1405**	873.9125	918.9125	**1455**	875.1625	920.1625
1356	872.6875	917.6875	**1406**	873.9375	918.9375	**1456**	875.1875	920.1875
1357	872.7125	917.7125	**1407**	873.9625	918.9625	**1457**	875.2125	920.2125
1358	872.7375	917.7375	**1408**	873.9875	918.9875	**1458**	875.2375	920.2375
1359	872.7625	917.7625	**1409**	874.0125	919.0125	**1459**	875.2625	920.2625
1360	872.7875	917.7875	**1410**	874.0375	919.0375	**1460**	875.2875	920.2875
1361	872.8125	917.8125	**1411**	874.0625	919.0625	**1461**	875.3125	920.3125
1362	872.8375	917.8375	**1412**	874.0875	919.0875	**1462**	875.3375	920.3375
1363	872.8625	917.8625	**1413**	874.1125	919.1125	**1463**	875.3625	920.3625
1364	872.8875	917.8875	**1414**	874.1375	919.1375	**1464**	875.3875	920.3875
1365	872.9125	917.9125	**1415**	874.1625	919.1625	**1465**	875.4125	920.4125
1366	872.9375	917.9375	**1416**	874.1875	919.1875	**1466**	875.4375	920.4375
1367	872.9625	917.9625	**1417**	874.2125	919.2125	**1467**	875.4625	920.4625
1368	872.9875	917.9875	**1418**	874.2375	919.2375	**1468**	875.4875	920.4875
1369	873.0125	918.0125	**1419**	874.2625	919.2625	**1469**	875.5125	920.5125
1370	873.0375	918.0375	**1420**	874.2875	919.2875	**1470**	875.5375	920.5375
1371	873.0625	918.0625	**1421**	874.3125	919.3125	**1471**	875.5625	920.5625
1372	873.0875	918.0875	**1422**	874.3375	919.3375	**1472**	875.5875	920.5875
1373	873.1125	918.1125	**1423**	874.3625	919.3625	**1473**	875.6125	920.6125
1374	873.1375	918.1375	**1424**	874.3875	919.3875	**1474**	875.6375	920.6375
1375	873.1625	918.1625	**1425**	874.4125	919.4125	**1475**	875.6625	920.6625
1376	873.1875	918.1875	**1426**	874.4375	919.4375	**1476**	875.6875	920.6875
1377	873.2125	918.2125	**1427**	874.4625	919.4625	**1477**	875.7125	920.7125
1378	873.2375	918.2375	**1428**	874.4875	919.4875	**1478**	875.7375	920.7375

Table 1. Frequency Table for ETACS, Channels 1479 - 1628

Ch.	Tx	Rx	Ch.	Tx	Rx	Ch.	Tx	Rx
1479	875.7625	920.7625	**1529**	877.0125	922.0125	**1579**	878.2625	923.2625
1480	875.7875	920.7875	**1530**	877.0375	922.0375	**1580**	878.2875	923.2875
1481	875.8125	920.8125	**1531**	877.0625	922.0625	**1581**	878.3125	923.3125
1482	875.8375	920.8375	**1532**	877.0875	922.0875	**1582**	878.3375	923.3375
1483	875.8625	920.8625	**1533**	877.1125	922.1125	**1583**	878.3625	923.3625
1484	875.8875	920.8875	**1534**	877.1375	922.1375	**1584**	878.3875	923.3875
1485	875.9125	920.9125	**1535**	877.1625	922.1625	**1585**	878.4125	923.4125
1486	875.9375	920.9375	**1536**	877.1875	922.1875	**1586**	878.4375	923.4375
1487	875.9625	920.9625	**1537**	877.2125	922.2125	**1587**	878.4625	923.4625
1488	875.9875	920.9875	**1538**	877.2375	922.2375	**1588**	878.4875	923.4875
1489	876.0125	921.0125	**1539**	877.2625	922.2625	**1589**	878.5125	923.5125
1490	876.0375	921.0375	**1540**	877.2875	922.2875	**1590**	878.5375	923.5375
1491	876.0625	921.0625	**1541**	877.3125	922.3125	**1591**	878.5625	923.5625
1492	876.0875	921.0875	**1542**	877.3375	922.3375	**1592**	878.5875	923.5875
1493	876.1125	921.1125	**1543**	877.3625	922.3625	**1593**	878.6125	923.6125
1494	876.1375	921.1375	**1544**	877.3875	922.3875	**1594**	878.6375	923.6375
1495	876.1625	921.1625	**1545**	877.4125	922.4125	**1595**	878.6625	923.6625
1496	876.1875	921.1875	**1546**	877.4375	922.4375	**1596**	878.6875	923.6875
1497	876.2125	921.2125	**1547**	877.4625	922.4625	**1597**	878.7125	923.7125
1498	876.2375	921.2375	**1548**	877.4875	922.4875	**1598**	878.7375	923.7375
1499	876.2625	921.2625	**1549**	877.5125	922.5125	**1599**	878.7625	923.7625
1500	876.2875	921.2875	**1550**	877.5375	922.5375	**1600**	878.7875	923.7875
1501	876.3125	921.3125	**1551**	877.5625	922.5625	**1601**	878.8125	923.8125
1502	876.3375	921.3375	**1552**	877.5875	922.5875	**1602**	878.8375	923.8375
1503	876.3625	921.3625	**1553**	877.6125	922.6125	**1603**	878.8625	923.8625
1504	876.3875	921.3875	**1554**	877.6375	922.6375	**1604**	878.8875	923.8875
1505	876.4125	921.4125	**1555**	877.6625	922.6625	**1605**	878.9125	923.9125
1506	876.4375	921.4375	**1556**	877.6875	922.6875	**1606**	878.9375	923.9375
1507	876.4625	921.4625	**1557**	877.7125	922.7125	**1607**	878.9625	923.9625
1508	876.4875	921.4875	**1558**	877.7375	922.7375	**1608**	878.9875	923.9875
1509	876.5125	921.5125	**1559**	877.7625	922.7625	**1609**	879.0125	924.0125
1510	876.5375	921.5375	**1560**	877.7875	922.7875	**1610**	879.0375	924.0375
1511	876.5625	921.5625	**1561**	877.8125	922.8125	**1611**	879.0625	924.0625
1512	876.5875	921.5875	**1562**	877.8375	922.8375	**1612**	879.0875	924.0875
1513	876.6125	921.6125	**1563**	877.8625	922.8625	**1613**	879.1125	924.1125
1514	876.6375	921.6375	**1564**	877.8875	922.8875	**1614**	879.1375	924.1375
1515	876.6625	921.6625	**1565**	877.9125	922.9125	**1615**	879.1625	924.1625
1516	876.6875	921.6875	**1566**	877.9375	922.9375	**1616**	879.1875	924.1875
1517	876.7125	921.7125	**1567**	877.9625	922.9625	**1617**	879.2125	924.2125
1518	876.7375	921.7375	**1568**	877.9875	922.9875	**1618**	879.2375	924.2375
1519	876.7625	921.7625	**1569**	878.0125	923.0125	**1619**	879.2625	924.2625
1520	876.7875	921.7875	**1570**	878.0375	923.0375	**1620**	879.2875	924.2875
1521	876.8125	921.8125	**1571**	878.0625	923.0625	**1621**	879.3125	924.3125
1522	876.8375	921.8375	**1572**	878.0875	923.0875	**1622**	879.3375	924.3375
1523	876.8625	921.8625	**1573**	878.1125	923.1125	**1623**	879.3625	924.3625
1524	876.8875	921.8875	**1574**	878.1375	923.1375	**1624**	879.3875	924.3875
1525	876.9125	921.9125	**1575**	878.1625	923.1625	**1625**	879.4125	924.4125
1526	876.9375	921.9375	**1576**	878.1875	923.1875	**1626**	879.4375	924.4375
1527	876.9625	921.9625	**1577**	878.2125	923.2125	**1627**	879.4625	924.4625
1528	876.9875	921.9875	**1578**	878.2375	923.2375	**1628**	879.4875	924.4875

Table 1. Frequency Table for ETACS, Channels 1629 - 1778

Ch.	Tx	Rx	Ch.	Tx	Rx	Ch.	Tx	Rx
1629	879.5125	924.5125	**1679**	880.7625	925.7625	**1729**	882.0125	927.0125
1630	879.5375	924.5375	**1680**	880.7875	925.7875	**1730**	882.0375	927.0375
1631	879.5625	924.5625	**1681**	880.8125	925.8125	**1731**	882.0625	927.0625
1632	879.5875	924.5875	**1682**	880.8375	925.8375	**1732**	882.0875	927.0875
1633	879.6125	924.6125	**1683**	880.8625	925.8625	**1733**	882.1125	927.1125
1634	879.6375	924.6375	**1684**	880.8875	925.8875	**1734**	882.1375	927.1375
1635	879.6625	924.6625	**1685**	880.9125	925.9125	**1735**	882.1625	927.1625
1636	879.6875	924.6875	**1686**	880.9375	925.9375	**1736**	882.1875	927.1875
1637	879.7125	924.7125	**1687**	880.9625	925.9625	**1737**	882.2125	927.2125
1638	879.7375	924.7375	**1688**	880.9875	925.9875	**1738**	882.2375	927.2375
1639	879.7625	924.7625	**1689**	881.0125	926.0125	**1739**	882.2625	927.2625
1640	879.7875	924.7875	**1690**	881.0375	926.0375	**1740**	882.2875	927.2875
1641	879.8125	924.8125	**1691**	881.0625	926.0625	**1741**	882.3125	927.3125
1642	879.8375	924.8375	**1692**	881.0875	926.0875	**1742**	882.3375	927.3375
1643	879.8625	924.8625	**1693**	881.1125	926.1125	**1743**	882.3625	927.3625
1644	879.8875	924.8875	**1694**	881.1375	926.1375	**1744**	882.3875	927.3875
1645	879.9125	924.9125	**1695**	881.1625	926.1625	**1745**	882.4125	927.4125
1646	879.9375	924.9375	**1696**	881.1875	926.1875	**1746**	882.4375	927.4375
1647	879.9625	924.9625	**1697**	881.2125	926.2125	**1747**	882.4625	927.4625
1648	879.9875	924.9875	**1698**	881.2375	926.2375	**1748**	882.4875	927.4875
1649	880.0125	925.0125	**1699**	881.2625	926.2625	**1749**	882.5125	927.5125
1650	880.0375	925.0375	**1700**	881.2875	926.2875	**1750**	882.5375	927.5375
1651	880.0625	925.0625	**1701**	881.3125	926.3125	**1751**	882.5625	927.5625
1652	880.0875	925.0875	**1702**	881.3375	926.3375	**1752**	882.5875	927.5875
1653	880.1125	925.1125	**1703**	881.3625	926.3625	**1753**	882.6125	927.6125
1654	880.1375	925.1375	**1704**	881.3875	926.3875	**1754**	882.6375	927.6375
1655	880.1625	925.1625	**1705**	881.4125	926.4125	**1755**	882.6625	927.6625
1656	880.1875	925.1875	**1706**	881.4375	926.4375	**1756**	882.6875	927.6875
1657	880.2125	925.2125	**1707**	881.4625	926.4625	**1757**	882.7125	927.7125
1658	880.2375	925.2375	**1708**	881.4875	926.4875	**1758**	882.7375	927.7375
1659	880.2625	925.2625	**1709**	881.5125	926.5125	**1759**	882.7625	927.7625
1660	880.2875	925.2875	**1710**	881.5375	926.5375	**1760**	882.7875	927.7875
1661	880.3125	925.3125	**1711**	881.5625	926.5625	**1761**	882.8125	927.8125
1662	880.3375	925.3375	**1712**	881.5875	926.5875	**1762**	882.8375	927.8375
1663	880.3625	925.3625	**1713**	881.6125	926.6125	**1763**	882.8625	927.8625
1664	880.3875	925.3875	**1714**	881.6375	926.6375	**1764**	882.8875	927.8875
1665	880.4125	925.4125	**1715**	881.6625	926.6625	**1765**	882.9125	927.9125
1666	880.4375	925.4375	**1716**	881.6875	926.6875	**1766**	882.9375	927.9375
1667	880.4625	925.4625	**1717**	881.7125	926.7125	**1767**	882.9625	927.9625
1668	880.4875	925.4875	**1718**	881.7375	926.7375	**1768**	882.9875	927.9875
1669	880.5125	925.5125	**1719**	881.7625	926.7625	**1769**	883.0125	928.0125
1670	880.5375	925.5375	**1720**	881.7875	926.7875	**1770**	883.0375	928.0375
1671	880.5625	925.5625	**1721**	881.8125	926.8125	**1771**	883.0625	928.0625
1672	880.5875	925.5875	**1722**	881.8375	926.8375	**1772**	883.0875	928.0875
1673	880.6125	925.6125	**1723**	881.8625	926.8625	**1773**	883.1125	928.1125
1674	880.6375	925.6375	**1724**	881.8875	926.8875	**1774**	883.1375	928.1375
1675	880.6625	925.6625	**1725**	881.9125	926.9125	**1775**	883.1625	928.1625
1676	880.6875	925.6875	**1726**	881.9375	926.9375	**1776**	883.1875	928.1875
1677	880.7125	925.7125	**1727**	881.9625	926.9625	**1777**	883.2125	928.2125
1678	880.7375	925.7375	**1728**	881.9875	926.9875	**1778**	883.2375	928.2375

Table 1. Frequency Table for ETACS, Channels 1779 - 1928

Ch.	Tx	Rx	Ch.	Tx	Rx	Ch.	Tx	Rx
1779	883.2625	928.2625	**1829**	884.5125	929.5125	**1879**	885.7625	930.7625
1780	883.2875	928.2875	**1830**	884.5375	929.5375	**1880**	885.7875	930.7875
1781	883.3125	928.3125	**1831**	884.5625	929.5625	**1881**	885.8125	930.8125
1782	883.3375	928.3375	**1832**	884.5875	929.5875	**1882**	885.8375	930.8375
1783	883.3625	928.3625	**1833**	884.6125	929.6125	**1883**	885.8625	930.8625
1784	883.3875	928.3875	**1834**	884.6375	929.6375	**1884**	885.8875	930.8875
1785	883.4125	928.4125	**1835**	884.6625	929.6625	**1885**	885.9125	930.9125
1786	883.4375	928.4375	**1836**	884.6875	929.6875	**1886**	885.9375	930.9375
1787	883.4625	928.4625	**1837**	884.7125	929.7125	**1887**	885.9625	930.9625
1788	883.4875	928.4875	**1838**	884.7375	929.7375	**1888**	885.9875	930.9875
1789	883.5125	928.5125	**1839**	884.7625	929.7625	**1889**	886.0125	931.0125
1790	883.5375	928.5375	**1840**	884.7875	929.7875	**1890**	886.0375	931.0375
1791	883.5625	928.5625	**1841**	884.8125	929.8125	**1891**	886.0625	931.0625
1792	883.5875	928.5875	**1842**	884.8375	929.8375	**1892**	886.0875	931.0875
1793	883.6125	928.6125	**1843**	884.8625	929.8625	**1893**	886.1125	931.1125
1794	883.6375	928.6375	**1844**	884.8875	929.8875	**1894**	886.1375	931.1375
1795	883.6625	928.6625	**1845**	884.9125	929.9125	**1895**	886.1625	931.1625
1796	883.6875	928.6875	**1846**	884.9375	929.9375	**1896**	886.1875	931.1875
1797	883.7125	928.7125	**1847**	884.9625	929.9625	**1897**	886.2125	931.2125
1798	883.7375	928.7375	**1848**	884.9875	929.9875	**1898**	886.2375	931.2375
1799	883.7625	928.7625	**1849**	885.0125	930.0125	**1899**	886.2625	931.2625
1800	883.7875	928.7875	**1850**	885.0375	930.0375	**1900**	886.2875	931.2875
1801	883.8125	928.8125	**1851**	885.0625	930.0625	**1901**	886.3125	931.3125
1802	883.8375	928.8375	**1852**	885.0875	930.0875	**1902**	886.3375	931.3375
1803	883.8625	928.8625	**1853**	885.1125	930.1125	**1903**	886.3625	931.3625
1804	883.8875	928.8875	**1854**	885.1375	930.1375	**1904**	886.3875	931.3875
1805	883.9125	928.9125	**1855**	885.1625	930.1625	**1905**	886.4125	931.4125
1806	883.9375	928.9375	**1856**	885.1875	930.1875	**1906**	886.4375	931.4375
1807	883.9625	928.9625	**1857**	885.2125	930.2125	**1907**	886.4625	931.4625
1808	883.9875	928.9875	**1858**	885.2375	930.2375	**1908**	886.4875	931.4875
1809	884.0125	929.0125	**1859**	885.2625	930.2625	**1909**	886.5125	931.5125
1810	884.0375	929.0375	**1860**	885.2875	930.2875	**1910**	886.5375	931.5375
1811	884.0625	929.0625	**1861**	885.3125	930.3125	**1911**	886.5625	931.5625
1812	884.0875	929.0875	**1862**	885.3375	930.3375	**1912**	886.5875	931.5875
1813	884.1125	929.1125	**1863**	885.3625	930.3625	**1913**	886.6125	931.6125
1814	884.1375	929.1375	**1864**	885.3875	930.3875	**1914**	886.6375	931.6375
1815	884.1625	929.1625	**1865**	885.4125	930.4125	**1915**	886.6625	931.6625
1816	884.1875	929.1875	**1866**	885.4375	930.4375	**1916**	886.6875	931.6875
1817	884.2125	929.2125	**1867**	885.4625	930.4625	**1917**	886.7125	931.7125
1818	884.2375	929.2375	**1868**	885.4875	930.4875	**1918**	886.7375	931.7375
1819	884.2625	929.2625	**1869**	885.5125	930.5125	**1919**	886.7625	931.7625
1820	884.2875	929.2875	**1870**	885.5375	930.5375	**1920**	886.7875	931.7875
1821	884.3125	929.3125	**1871**	885.5625	930.5625	**1921**	886.8125	931.8125
1822	884.3375	929.3375	**1872**	885.5875	930.5875	**1922**	886.8375	931.8375
1823	884.3625	929.3625	**1873**	885.6125	930.6125	**1923**	886.8625	931.8625
1824	884.3875	929.3875	**1874**	885.6375	930.6375	**1924**	886.8875	931.8875
1825	884.4125	929.4125	**1875**	885.6625	930.6625	**1925**	886.9125	931.9125
1826	884.4375	929.4375	**1876**	885.6875	930.6875	**1926**	886.9375	931.9375
1827	884.4625	929.4625	**1877**	885.7125	930.7125	**1927**	886.9625	931.9625
1828	884.4875	929.4875	**1878**	885.7375	930.7375	**1928**	886.9875	931.9875

Table 1. Frequency Table for ETACS, Channels 1929 - 2047

Ch.	Tx	Rx	Ch.	Tx	Rx	Ch.	Tx	Rx
1929	887.0125	932.0125	**1979**	888.2625	933.2625	**2029**	889.5125	934.5125
1930	887.0375	932.0375	**1980**	888.2875	933.2875	**2030**	889.5375	934.5375
1931	887.0625	932.0625	**1981**	888.3125	933.3125	**2031**	889.5625	934.5625
1932	887.0875	932.0875	**1982**	888.3375	933.3375	**2032**	889.5875	934.5875
1933	887.1125	932.1125	**1983**	888.3625	933.3625	**2033**	889.6125	934.6125
1934	887.1375	932.1375	**1984**	888.3875	933.3875	**2034**	889.6375	934.6375
1935	887.1625	932.1625	**1985**	888.4125	933.4125	**2035**	889.6625	934.6625
1936	887.1875	932.1875	**1986**	888.4375	933.4375	**2036**	889.6875	934.6875
1937	887.2125	932.2125	**1987**	888.4625	933.4625	**2037**	889.7125	934.7125
1938	887.2375	932.2375	**1988**	888.4875	933.4875	**2038**	889.7375	934.7375
1939	887.2625	932.2625	**1989**	888.5125	933.5125	**2039**	889.7625	934.7625
1940	887.2875	932.2875	**1990**	888.5375	933.5375	**2040**	889.7875	934.7875
1941	887.3125	932.3125	**1991**	888.5625	933.5625	**2041**	889.8125	934.8125
1942	887.3375	932.3375	**1992**	888.5875	933.5875	**2042**	889.8375	934.8375
1943	887.3625	932.3625	**1993**	888.6125	933.6125	**2043**	889.8625	934.8625
1944	887.3875	932.3875	**1994**	888.6375	933.6375	**2044**	889.8875	934.8875
1945	887.4125	932.4125	**1995**	888.6625	933.6625	**2045**	889.9125	934.9125
1946	887.4375	932.4375	**1996**	888.6875	933.6875	**2046**	889.9375	934.9375
1947	887.4625	932.4625	**1997**	888.7125	933.7125	**2047**	889.9625	934.9625
1948	887.4875	932.4875	**1998**	888.7375	933.7375			
1949	887.5125	932.5125	**1999**	888.7625	933.7625			
1950	887.5375	932.5375	**2000**	888.7875	933.7875			
1951	887.5625	932.5625	**2001**	888.8125	933.8125			
1952	887.5875	932.5875	**2002**	888.8375	933.8375			
1953	887.6125	932.6125	**2003**	888.8625	933.8625			
1954	887.6375	932.6375	**2004**	888.8875	933.8875			
1955	887.6625	932.6625	**2005**	888.9125	933.9125			
1956	887.6875	932.6875	**2006**	888.9375	933.9375			
1957	887.7125	932.7125	**2007**	888.9625	933.9625			
1958	887.7375	932.7375	**2008**	888.9875	933.9875			
1959	887.7625	932.7625	**2009**	889.0125	934.0125			
1960	887.7875	932.7875	**2010**	889.0375	934.0375			
1961	887.8125	932.8125	**2011**	889.0625	934.0625			
1962	887.8375	932.8375	**2012**	889.0875	934.0875			
1963	887.8625	932.8625	**2013**	889.1125	934.1125			
1964	887.8875	932.8875	**2014**	889.1375	934.1375			
1965	887.9125	932.9125	**2015**	889.1625	934.1625			
1966	887.9375	932.9375	**2016**	889.1875	934.1875			
1967	887.9625	932.9625	**2017**	889.2125	934.2125			
1968	887.9875	932.9875	**2018**	889.2375	934.2375			
1969	888.0125	933.0125	**2019**	889.2625	934.2625			
1970	888.0375	933.0375	**2020**	889.2875	934.2875			
1971	888.0625	933.0625	**2021**	889.3125	934.3125			
1972	888.0875	933.0875	**2022**	889.3375	934.3375			
1973	888.1125	933.1125	**2023**	889.3625	934.3625			
1974	888.1375	933.1375	**2024**	889.3875	934.3875			
1975	888.1625	933.1625	**2025**	889.4125	934.4125			
1976	888.1875	933.1875	**2026**	889.4375	934.4375			
1977	888.2125	933.2125	**2027**	889.4625	934.4625			
1978	888.2375	933.2375	**2028**	889.4875	934.4875			

Table 2. Frequency Table for ETACS, Channels 0 - 149

Ch.	Tx	Rx	Ch.	Tx	Rx	Ch.	Tx	Rx
0	889.9875	934.9875	**50**	891.2375	936.2375	**100**	892.4875	937.4875
1	890.0125	935.0125	**51**	891.2625	936.2625	**101**	892.5125	937.5125
2	890.0375	935.0375	**52**	891.2875	936.2875	**102**	892.5375	937.5375
3	890.0625	935.0625	**53**	891.3125	936.3125	**103**	892.5625	937.5625
4	890.0875	935.0875	**54**	891.3375	936.3375	**104**	892.5875	937.5875
5	890.1125	935.1125	**55**	891.3625	936.3625	**105**	892.6125	937.6125
6	890.1375	935.1375	**56**	891.3875	936.3875	**106**	892.6375	937.6375
7	890.1625	935.1625	**57**	891.4125	936.4125	**107**	892.6625	937.6625
8	890.1875	935.1875	**58**	891.4375	936.4375	**108**	892.6875	937.6875
9	890.2125	935.2125	**59**	891.4625	936.4625	**109**	892.7125	937.7125
10	890.2375	935.2375	**60**	891.4875	936.4875	**110**	892.7375	937.7375
11	890.2625	935.2625	**61**	891.5125	936.5125	**111**	892.7625	937.7625
12	890.2875	935.2875	**62**	891.5375	936.5375	**112**	892.7875	937.7875
13	890.3125	935.3125	**63**	891.5625	936.5625	**113**	892.8125	937.8125
14	890.3375	935.3375	**64**	891.5875	936.5875	**114**	892.8375	937.8375
15	890.3625	935.3625	**65**	891.6125	936.6125	**115**	892.8625	937.8625
16	890.3875	935.3875	**66**	891.6375	936.6375	**116**	892.8875	937.8875
17	890.4125	935.4125	**67**	891.6625	936.6625	**117**	892.9125	937.9125
18	890.4375	935.4375	**68**	891.6875	936.6875	**118**	892.9375	937.9375
19	890.4625	935.4625	**69**	891.7125	936.7125	**119**	892.9625	937.9625
20	890.4875	935.4875	**70**	891.7375	936.7375	**120**	892.9875	937.9875
21	890.5125	935.5125	**71**	891.7625	936.7625	**121**	893.0125	938.0125
22	890.5375	935.5375	**72**	891.7875	936.7875	**122**	893.0375	938.0375
23	890.5625	935.5625	**73**	891.8125	936.8125	**123**	893.0625	938.0625
24	890.5875	935.5875	**74**	891.8375	936.8375	**124**	893.0875	938.0875
25	890.6125	935.6125	**75**	891.8625	936.8625	**125**	893.1125	938.1125
26	890.6375	935.6375	**76**	891.8875	936.8875	**126**	893.1375	938.1375
27	890.6625	935.6625	**77**	891.9125	936.9125	**127**	893.1625	938.1625
28	890.6875	935.6875	**78**	891.9375	936.9375	**128**	893.1875	938.1875
29	890.7125	935.7125	**79**	891.9625	936.9625	**129**	893.2125	938.2125
30	890.7375	935.7375	**80**	891.9875	936.9875	**130**	893.2375	938.2375
31	890.7625	935.7625	**81**	892.0125	937.0125	**131**	893.2625	938.2625
32	890.7875	935.7875	**82**	892.0375	937.0375	**132**	893.2875	938.2875
33	890.8125	935.8125	**83**	892.0625	937.0625	**133**	893.3125	938.3125
34	890.8375	935.8375	**84**	892.0875	937.0875	**134**	893.3375	938.3375
35	890.8625	935.8625	**85**	892.1125	937.1125	**135**	893.3625	938.3625
36	890.8875	935.8875	**86**	892.1375	937.1375	**136**	893.3875	938.3875
37	890.9125	935.9125	**87**	892.1625	937.1625	**137**	893.4125	938.4125
38	890.9375	935.9375	**88**	892.1875	937.1875	**138**	893.4375	938.4375
39	890.9625	935.9625	**89**	892.2125	937.2125	**139**	893.4625	938.4625
40	890.9875	935.9875	**90**	892.2375	937.2375	**140**	893.4875	938.4875
41	891.0125	936.0125	**91**	892.2625	937.2625	**141**	893.5125	938.5125
42	891.0375	936.0375	**92**	892.2875	937.2875	**142**	893.5375	938.5375
43	891.0625	936.0625	**93**	892.3125	937.3125	**143**	893.5625	938.5625
44	891.0875	936.0875	**94**	892.3375	937.3375	**144**	893.5875	938.5875
45	891.1125	936.1125	**95**	892.3625	937.3625	**145**	893.6125	938.6125
46	891.1375	936.1375	**96**	892.3875	937.3875	**146**	893.6375	938.6375
47	891.1625	936.1625	**97**	892.4125	937.4125	**147**	893.6625	938.6625
48	891.1875	936.1875	**98**	892.4375	937.4375	**148**	893.6875	938.6875
49	891.2125	936.2125	**99**	892.4625	937.4625	**149**	893.7125	938.7125

Table 2. Frequency Table for ETACS, Channels 150 - 299

Ch.	Tx	Rx	Ch.	Tx	Rx	Ch.	Tx	Rx
150	893.7375	938.7375	**200**	894.9875	939.9875	**250**	896.2375	941.2375
151	893.7625	938.7625	**201**	895.0125	940.0125	**251**	896.2625	941.2625
152	893.7875	938.7875	**202**	895.0375	940.0375	**252**	896.2875	941.2875
153	893.8125	938.8125	**203**	895.0625	940.0625	**253**	896.3125	941.3125
154	893.8375	938.8375	**204**	895.0875	940.0875	**254**	896.3375	941.3375
155	893.8625	938.8625	**205**	895.1125	940.1125	**255**	896.3625	941.3625
156	893.8875	938.8875	**206**	895.1375	940.1375	**256**	896.3875	941.3875
157	893.9125	938.9125	**207**	895.1625	940.1625	**257**	896.4125	941.4125
158	893.9375	938.9375	**208**	895.1875	940.1875	**258**	896.4375	941.4375
159	893.9625	938.9625	**209**	895.2125	940.2125	**259**	896.4625	941.4625
160	893.9875	938.9875	**210**	895.2375	940.2375	**260**	896.4875	941.4875
161	894.0125	939.0125	**211**	895.2625	940.2625	**261**	896.5125	941.5125
162	894.0375	939.0375	**212**	895.2875	940.2875	**262**	896.5375	941.5375
163	894.0625	939.0625	**213**	895.3125	940.3125	**263**	896.5625	941.5625
164	894.0875	939.0875	**214**	895.3375	940.3375	**264**	896.5875	941.5875
165	894.1125	939.1125	**215**	895.3625	940.3625	**265**	896.6125	941.6125
166	894.1375	939.1375	**216**	895.3875	940.3875	**266**	896.6375	941.6375
167	894.1625	939.1625	**217**	895.4125	940.4125	**267**	896.6625	941.6625
168	894.1875	939.1875	**218**	895.4375	940.4375	**268**	896.6875	941.6875
169	894.2125	939.2125	**219**	895.4625	940.4625	**269**	896.7125	941.7125
170	894.2375	939.2375	**220**	895.4875	940.4875	**270**	896.7375	941.7375
171	894.2625	939.2625	**221**	895.5125	940.5125	**271**	896.7625	941.7625
172	894.2875	939.2875	**222**	895.5375	940.5375	**272**	896.7875	941.7875
173	894.3125	939.3125	**223**	895.5625	940.5625	**273**	896.8125	941.8125
174	894.3375	939.3375	**224**	895.5875	940.5875	**274**	896.8375	941.8375
175	894.3625	939.3625	**225**	895.6125	940.6125	**275**	896.8625	941.8625
176	894.3875	939.3875	**226**	895.6375	940.6375	**276**	896.8875	941.8875
177	894.4125	939.4125	**227**	895.6625	940.6625	**277**	896.9125	941.9125
178	894.4375	939.4375	**228**	895.6875	940.6875	**278**	896.9375	941.9375
179	894.4625	939.4625	**229**	895.7125	940.7125	**279**	896.9625	941.9625
180	894.4875	939.4875	**230**	895.7375	940.7375	**280**	896.9875	941.9875
181	894.5125	939.5125	**231**	895.7625	940.7625	**281**	897.0125	942.0125
182	894.5375	939.5375	**232**	895.7875	940.7875	**282**	897.0375	942.0375
183	894.5625	939.5625	**233**	895.8125	940.8125	**283**	897.0625	942.0625
184	894.5875	939.5875	**234**	895.8375	940.8375	**284**	897.0875	942.0875
185	894.6125	939.6125	**235**	895.8625	940.8625	**285**	897.1125	942.1125
186	894.6375	939.6375	**236**	895.8875	940.8875	**286**	897.1375	942.1375
187	894.6625	939.6625	**237**	895.9125	940.9125	**287**	897.1625	942.1625
188	894.6875	939.6875	**238**	895.9375	940.9375	**288**	897.1875	942.1875
189	894.7125	939.7125	**239**	895.9625	940.9625	**289**	897.2125	942.2125
190	894.7375	939.7375	**240**	895.9875	940.9875	**290**	897.2375	942.2375
191	894.7625	939.7625	**241**	896.0125	941.0125	**291**	897.2625	942.2625
192	894.7875	939.7875	**242**	896.0375	941.0375	**292**	897.2875	942.2875
193	894.8125	939.8125	**243**	896.0625	941.0625	**293**	897.3125	942.3125
194	894.8375	939.8375	**244**	896.0875	941.0875	**294**	897.3375	942.3375
195	894.8625	939.8625	**245**	896.1125	941.1125	**295**	897.3625	942.3625
196	894.8875	939.8875	**246**	896.1375	941.1375	**296**	897.3875	942.3875
197	894.9125	939.9125	**247**	896.1625	941.1625	**297**	897.4125	942.4125
198	894.9375	939.9375	**248**	896.1875	941.1875	**298**	897.4375	942.4375
199	894.9625	939.9625	**249**	896.2125	941.2125	**299**	897.4625	942.4625

Table 2. Frequency Table for ETACS, Channels 300 - 449

Ch.	Tx	Rx	Ch.	Tx	Rx	Ch.	Tx	Rx
300	897.4875	942.4875	**350**	898.7375	943.7375	**400**	899.9875	944.9875
301	897.5125	942.5125	**351**	898.7625	943.7625	**401**	900.0125	945.0125
302	897.5375	942.5375	**352**	898.7875	943.7875	**402**	900.0375	945.0375
303	897.5625	942.5625	**353**	898.8125	943.8125	**403**	900.0625	945.0625
304	897.5875	942.5875	**354**	898.8375	943.8375	**404**	900.0875	945.0875
305	897.6125	942.6125	**355**	898.8625	943.8625	**405**	900.1125	945.1125
306	897.6375	942.6375	**356**	898.8875	943.8875	**406**	900.1375	945.1375
307	897.6625	942.6625	**357**	898.9125	943.9125	**407**	900.1625	945.1625
308	897.6875	942.6875	**358**	898.9375	943.9375	**408**	900.1875	945.1875
309	897.7125	942.7125	**359**	898.9625	943.9625	**409**	900.2125	945.2125
310	897.7375	942.7375	**360**	898.9875	943.9875	**410**	900.2375	945.2375
311	897.7625	942.7625	**361**	899.0125	944.0125	**411**	900.2625	945.2625
312	897.7875	942.7875	**362**	899.0375	944.0375	**412**	900.2875	945.2875
313	897.8125	942.8125	**363**	899.0625	944.0625	**413**	900.3125	945.3125
314	897.8375	942.8375	**364**	899.0875	944.0875	**414**	900.3375	945.3375
315	897.8625	942.8625	**365**	899.1125	944.1125	**415**	900.3625	945.3625
316	897.8875	942.8875	**366**	899.1375	944.1375	**416**	900.3875	945.3875
317	897.9125	942.9125	**367**	899.1625	944.1625	**417**	900.4125	945.4125
318	897.9375	942.9375	**368**	899.1875	944.1875	**418**	900.4375	945.4375
319	897.9625	942.9625	**369**	899.2125	944.2125	**419**	900.4625	945.4625
320	897.9875	942.9875	**370**	899.2375	944.2375	**420**	900.4875	945.4875
321	898.0125	943.0125	**371**	899.2625	944.2625	**421**	900.5125	945.5125
322	898.0375	943.0375	**372**	899.2875	944.2875	**422**	900.5375	945.5375
323	898.0625	943.0625	**373**	899.3125	944.3125	**423**	900.5625	945.5625
324	898.0875	943.0875	**374**	899.3375	944.3375	**424**	900.5875	945.5875
325	898.1125	943.1125	**375**	899.3625	944.3625	**425**	900.6125	945.6125
326	898.1375	943.1375	**376**	899.3875	944.3875	**426**	900.6375	945.6375
327	898.1625	943.1625	**377**	899.4125	944.4125	**427**	900.6625	945.6625
328	898.1875	943.1875	**378**	899.4375	944.4375	**428**	900.6875	945.6875
329	898.2125	943.2125	**379**	899.4625	944.4625	**429**	900.7125	945.7125
330	898.2375	943.2375	**380**	899.4875	944.4875	**430**	900.7375	945.7375
331	898.2625	943.2625	**381**	899.5125	944.5125	**431**	900.7625	945.7625
332	898.2875	943.2875	**382**	899.5375	944.5375	**432**	900.7875	945.7875
333	898.3125	943.3125	**383**	899.5625	944.5625	**433**	900.8125	945.8125
334	898.3375	943.3375	**384**	899.5875	944.5875	**434**	900.8375	945.8375
335	898.3625	943.3625	**385**	899.6125	944.6125	**435**	900.8625	945.8625
336	898.3875	943.3875	**386**	899.6375	944.6375	**436**	900.8875	945.8875
337	898.4125	943.4125	**387**	899.6625	944.6625	**437**	900.9125	945.9125
338	898.4375	943.4375	**388**	899.6875	944.6875	**438**	900.9375	945.9375
339	898.4625	943.4625	**389**	899.7125	944.7125	**439**	900.9625	945.9625
340	898.4875	943.4875	**390**	899.7375	944.7375	**440**	900.9875	945.9875
341	898.5125	943.5125	**391**	899.7625	944.7625	**441**	901.0125	946.0125
342	898.5375	943.5375	**392**	899.7875	944.7875	**442**	901.0375	946.0375
343	898.5625	943.5625	**393**	899.8125	944.8125	**443**	901.0625	946.0625
344	898.5875	943.5875	**394**	899.8375	944.8375	**444**	901.0875	946.0875
345	898.6125	943.6125	**395**	899.8625	944.8625	**445**	901.1125	946.1125
346	898.6375	943.6375	**396**	899.8875	944.8875	**446**	901.1375	946.1375
347	898.6625	943.6625	**397**	899.9125	944.9125	**447**	901.1625	946.1625
348	898.6875	943.6875	**398**	899.9375	944.9375	**448**	901.1875	946.1875
349	898.7125	943.7125	**399**	899.9625	944.9625	**449**	901.2125	946.2125

Table 2. Frequency Table for ETACS, Channels 450 - 600

Ch.	Tx	Rx	Ch.	Tx	Rx	Ch.	Tx	Rx
450	901.2375	946.2375	**500**	902.4875	947.4875	**550**	903.7375	948.7375
451	901.2625	946.2625	**501**	902.5125	947.5125	**551**	903.7625	948.7625
452	901.2875	946.2875	**502**	902.5375	947.5375	**552**	903.7875	948.7875
453	901.3125	946.3125	**503**	902.5625	947.5625	**553**	903.8125	948.8125
454	901.3375	946.3375	**504**	902.5875	947.5875	**554**	903.8375	948.8375
455	901.3625	946.3625	**505**	902.6125	947.6125	**555**	903.8625	948.8625
456	901.3875	946.3875	**506**	902.6375	947.6375	**556**	903.8875	948.8875
457	901.4125	946.4125	**507**	902.6625	947.6625	**557**	903.9125	948.9125
458	901.4375	946.4375	**508**	902.6875	947.6875	**558**	903.9375	948.9375
459	901.4625	946.4625	**509**	902.7125	947.7125	**559**	903.9625	948.9625
460	901.4875	946.4875	**510**	902.7375	947.7375	**560**	903.9875	948.9875
461	901.5125	946.5125	**511**	902.7625	947.7625	**561**	904.0125	949.0125
462	901.5375	946.5375	**512**	902.7875	947.7875	**562**	904.0375	949.0375
463	901.5625	946.5625	**513**	902.8125	947.8125	**563**	904.0625	949.0625
464	901.5875	946.5875	**514**	902.8375	947.8375	**564**	904.0875	949.0875
465	901.6125	946.6125	**515**	902.8625	947.8625	**565**	904.1125	949.1125
466	901.6375	946.6375	**516**	902.8875	947.8875	**566**	904.1375	949.1375
467	901.6625	946.6625	**517**	902.9125	947.9125	**567**	904.1625	949.1625
468	901.6875	946.6875	**518**	902.9375	947.9375	**568**	904.1875	949.1875
469	901.7125	946.7125	**519**	902.9625	947.9625	**569**	904.2125	949.2125
470	901.7375	946.7375	**520**	902.9875	947.9875	**570**	904.2375	949.2375
471	901.7625	946.7625	**521**	903.0125	948.0125	**571**	904.2625	949.2625
472	901.7875	946.7875	**522**	903.0375	948.0375	**572**	904.2875	949.2875
473	901.8125	946.8125	**523**	903.0625	948.0625	**573**	904.3125	949.3125
474	901.8375	946.8375	**524**	903.0875	948.0875	**574**	904.3375	949.3375
475	901.8625	946.8625	**525**	903.1125	948.1125	**575**	904.3625	949.3625
476	901.8875	946.8875	**526**	903.1375	948.1375	**576**	904.3875	949.3875
477	901.9125	946.9125	**527**	903.1625	948.1625	**577**	904.4125	949.4125
478	901.9375	946.9375	**528**	903.1875	948.1875	**578**	904.4375	949.4375
479	901.9625	946.9625	**529**	903.2125	948.2125	**579**	904.4625	949.4625
480	901.9875	946.9875	**530**	903.2375	948.2375	**580**	904.4875	949.4875
481	902.0125	947.0125	**531**	903.2625	948.2625	**581**	904.5125	949.5125
482	902.0375	947.0375	**532**	903.2875	948.2875	**582**	904.5375	949.5375
483	902.0625	947.0625	**533**	903.3125	948.3125	**583**	904.5625	949.5625
484	902.0875	947.0875	**534**	903.3375	948.3375	**584**	904.5875	949.5875
485	902.1125	947.1125	**535**	903.3625	948.3625	**585**	904.6125	949.6125
486	902.1375	947.1375	**536**	903.3875	948.3875	**586**	904.6375	949.6375
487	902.1625	947.1625	**537**	903.4125	948.4125	**587**	904.6625	949.6625
488	902.1875	947.1875	**538**	903.4375	948.4375	**588**	904.6875	949.6875
489	902.2125	947.2125	**539**	903.4625	948.4625	**589**	904.7125	949.7125
490	902.2375	947.2375	**540**	903.4875	948.4875	**590**	904.7375	949.7375
491	902.2625	947.2625	**541**	903.5125	948.5125	**591**	904.7625	949.7625
492	902.2875	947.2875	**542**	903.5375	948.5375	**592**	904.7875	949.7875
493	902.3125	947.3125	**543**	903.5625	948.5625	**593**	904.8125	949.8125
494	902.3375	947.3375	**544**	903.5875	948.5875	**594**	904.8375	949.8375
495	902.3625	947.3625	**545**	903.6125	948.6125	**595**	904.8625	949.8625
496	902.3875	947.3875	**546**	903.6375	948.6375	**596**	904.8875	949.8875
497	902.4125	947.4125	**547**	903.6625	948.6625	**597**	904.9125	949.9125
498	902.4375	947.4375	**548**	903.6875	948.6875	**598**	904.9375	949.9375
499	902.4625	947.4625	**549**	903.7125	948.7125	**599**	904.9625	949.9625
						600	904.9875	949.9875

Appendix B: Test Program

Contents

How to Use

This document will describe the use of the built-in test program for the handheld telephone. After the more extensive descriptions in ***Individual Test Options*** follows an overview in the form of a table with data pertaining to the different options. With some experience with the test program you may find this table a handy alternative.

Preparation

To prevent the telephone from switching off after 30 seconds in transmission mode, the *autonomous timeout* function must be disabled. This can be done by applying a voltage of +5 V at the VPPFLASH input (pin 9) of the external connector J105, or by activating the *Service* switch on the Service Adapter.

Initiating the Test Program

The test program is activated from the special test handset by holding down the **M** button and pressing **R** three times. However, if the *Test Program Enter* function is enabled in the telephone, the program can be activated and run directly from the keypad by holding down the **M** button and pressing

9 0 4 0 5 9

When the handheld telephone enters the test mode, the hardware is initialized. The text ***TEST INPUT*** appears on the display.

Display Test

The test program can be activated and run by a test handset. The display is tested with the aid of a special test option (No. 45).

Selecting a Specific Test

When the test program has been initiated, the prompt ***TEST INPUT*** appears on the display. A test option is selected by entering **X#** or **XY#** (X and Y are digits from 0 to 9).

You may also step up or down to the next option in the test program, using a test handset; the **SEND** button for up-step and the **RCL** button for down-step.

The specified test option will then be performed, and a message shown on the display. Any parameter set or read will be shown as well.

Data will be read and displayed once a second.

Selectable parameters may be altered by specifying the new value . If the new value is approved, the setting will be altered as shown by the display, and the current menu will remain active. If the new value is *not* approved, the old value will remain.

Example

How the different parameters are selected and introduced into a test is explained in ***Individual Test Options***. A complete series of entries may have the structure shown below:

1 # 3 2 6 # C 2 # 2 C 23 # 3 C

The first figure (**1**) is the number of the option ***CHANNEL NUMBER*** selected in the test menu. The next (**326**) is a channel number indexed while ***CHANNEL NUMBER*** applies.

The **2** after the asterisk indicates that option ***2 TX POWER*** of the menu has been selected. Here alternative **2** was chosen, which provides a transmission power of 0.45 W, as you will find in the description of this particular option.

Lastly, option **23** in the menu, ***MANCHOUT***, has been selected, and here alternative **3** will provide transmission of a special frame.

Return to TEST INPUT

Depress the **C**-button to return to the input mode, where the ***TEST INPUT*** prompt is displayed.

Exit

To leave the test program, select test option 99.

Individual Test Options

A list describing the use of the test program options follows below. A summary of the test options and possible parameter values is given in *Table 1*.

1 CH NR Setting of channel number. The initial setting is channel 1. Permissible settings: 1329 - 2047 and 0 - 600.
Select channel, indexing its number on the keypad and pressing **#**. The ▲ and ▼ buttons can be used to step forwards or backwards from the current channel number. Channel number and signal strength are displayed.

2 TX POWER Sets the transmitter ON/OFF and determines the output power level..
8 : OFF
7 : min
.
.
2 : max.
Note: The transmitter will go on only if the Tx and Rx synthesizers are locked.
The Power Reduction function (test 76), if activated, causes 2 (Power Level 2) to be displayed as **#**.

3 LOCKTIME (Factory use only). Measures Tx/Rx synth. locktime.

5 PWR CAL Calibration of power levels.
The frequency band is divided into three parts with three corresponding Transmitter Input Voltage Tables. Press **0**, **1** or **2** to select either table.The table showing power level and current voltage value is displayed, the initial value read from the EEPROM. Use the ▲ and ▼ buttons to change the value. Press **M** and **S** simultaneously to store the value in EEPROM or **M** and **#** to step to the next power level. When selecting a new table, the relevant channel for transmission is automatically selected.

Input Voltage Table and the corresponding channels:

Table	Used Channel	Channels
0	1500	1329-200
1	350	201-450
2	500	451-600

Power Levels and Output Power that should exist on the respective level:

Continued on next page

PL	*Output Power*
2	26.5 dBm+2/-4 dBm
3	22.5 dBm+2/-4 dBm
4	18.5 dBm+2/-4 dBm
5	14.5 dBm+2/-4 dBm
6	10.5 dBm+2/-4 dBm
7	6.5 dBm+2/-4 dBm

7 TXSENS (Factory use only). Control of soft trimmer potentiometers in the LINA circuit.
Press **M** & **#** to enable calibration and to display present value in the range 00 to 1F.
Press ▲ or ▼ to change the value.
Press **M** & **S** to store the new value in EEPROM.

9 RF CAL Setting of RSSI level and max. AFC frequency compensation. Before entering this option make sure that the frequency is properly aligned.

Adjust signal level to -115 dBm, and press **M** and S simultaneously. Value stored in EEPROM/RAM is displayed. If the frequency error of the received signal is greater than 1 kHz, an alarm will be heard, and further programming cannot take place.

10 RXSENS Adjustment of soft trimmer potentiometers in the LINA circuit.
0 : Rx source AFMS
1 : Rx source earphone
Press **M** & **#** to enable calibration and to display present value in the range from 00 to 1F.
Press ▲ or ▼ to change the value.
Press **M** & **S** to store the new value in EEPROM.

11 KEYPAD (Factory use only). Sends information on DFMS for each button pressed, except for the **C**-button.

12 C CAL Before entering this test, connect an ammeter between power supply and telephone. The value to be used in calibration is the shown value in mA divided by 700 and multiplied by 30 (which provides a 1- or 2-digit decimal value). When entering the test, the green LED and illumination will go On. Enter the divided-by-25 mA value and press **M** & **S**; a wrong entry may be erased by **M** & **#**.
After storing the standby consumption, the telephone turns the transmitter On, and the ammeter shows the lowest power level; divide and multiply ammeter reading, and calibrate as before.
Proceed with remaining power levels.

13 BANDGAP Calibration of Battery Full Level value and internal reference voltage ("Bandgap") in the BERTRAM circuit.
This calibration must be performed before any other calibration involving BERTRAM.

1. Adjust supply voltage to 5.3 V at battery connector and press **M** & **S** to memorize this calibration. The two values will be displayed - the Low Battery value in the AND*) and the internal reference voltage in the DDD*).
2. Increase the voltage to 8.1 V and press **M** & **S** to memorise this calibration. The stored value will be shown in the AND.

The program then returns to ***TEST INPUT.***

*) AND = Alpha/Numeric Display
DDD = Dialled Digits Display.

14 AUDDEV Adjustment of soft trimmer potentiometers in the LINA circuit. Max. deviation.
This calibration must be performed before any other calibration involving deviation.
Press **M** & **#** to enable calibration and to display present value in the range from 00 to 0F.
Press ▲ or ▼ to change the value.
Press **M** & **S** to store the new value in EEPROM.

15 AFC Selection of AFC mode (shown on the numeric display):
0 : AFC off
1 : Normal operation (default)
2 : Normal operation without age offset update
Any other code entered in Handset Mode will display:
TO TE FR S , where
TO = total compensation (temp.+ age + freq. error)
TE = temperature table compensation
FR = frequency error compensation
S = AFC state
1,2 = no valid RSSI
3 = locked to a channel;
4,5 = RSSI temperature lost

16 DAC1CAL (Factory use only). Automatic trimming of the TxVCO control input DC level (for radios with combined ceramic duplex filter). Pressing **M** & **0** will activate calibration and stored value will be shown on the DDD.

17 MF COUNT Counts how many E-clock cycles have elapsed while a counter in CARL counted 2432 cycles of the 54 kHz signal from BERTRAM. The number is subtracted from the correct number of cycles, and the result is shown as a 4-digit hexadecimal number, the relevant plus or minus sign included.

18 DAC2CAL Coarse calibration of the DAC for TCXO.
Check that the telephone is correctly tuned to a channel and that the RF signal is strong.
Press **M** & **0**, and calibration is performed automatically.
The stored value is displayed.
Alternatively:
Press **M** & **#** to enable calibration and to display present value.
Press ▲ or ▼ to change the value.
Press **M** & **S** to store the new value in EEPROM.
Note: The AFC operation mode (test no.15) must be set to normal operation.

19 RX SAT Reads and displays the frequency of the received supervisory audio tone (SAT).
Possible readings: 5970, 6000, and 6030.
The routine samples the SAT twenty times and will show the most sampled SAT together with the number of valid samples.

20 AUDIO Sets the audio paths in LINA.
0 : Both audio paths (ATMS & AFMS) disconnected
1 : Path out to handset (AFMS) disconnected;
into station (ATMS) connected
2 : Path out to handset (AFMS) connected;
into station (ATMS) disconnected
3 : Both audio paths (ATMS & AFMS) connected
(default condition).

21 HANDSET Sets the audio paths in the handset.
0 : Microphone and earphone OFF,
speaker OFF (default condition)
1 : Microphone and earphone ON, speaker OFF
2 : Microphone and earphone OFF, speaker ON

22 TX SAT Controls the SAT tone switch in LINA.
0 : 5970 Hz
1 : 6000 Hz
2 : 6030 Hz
3 : No SAT
4 : ON
5 : OFF
When the switch is on, it is also possible to adjust the soft trimmer potentiometers in the LINA circuit:
Press **M** & **#** to enable calibration and to display present value in the range from 00 to 0F.
Press ▲ or ▼ to change the value.
Press **M** & **S** to store the new value.
Note: Parameter no. 4 must be set (ON) before choosing options 0-2 for adjustment.
Default conditions are 3: NoSAT and 5:OFF.

23 MANCHOUT Sets the data frames to be transmitted.
Permissible settings:
0 : OFF (Initial setting)
1 : All digital 1
2 : All digital 0
3 : A special frame is transmitted.
It is also possible to adjust the soft trimmer potentiometers in the LINA circuit.
The transmitter must be on (test #2) to transmit FFSK.
Press **M** & **#** to enable calibration and to display present value in the range from 00 to 0F.
Press ▲ or ▼ to change the value.
Press **M** & **S** to store the new value.

24 MANCH IN Displays received data when **#** is pressed.
The current channel type is shown as well:
1 : Control Channel
2 : Voice Channel

25 VOLUME Sets the sound level of the speaker and earphone.
Possible values: 0-1-2-3-4-5-6-7
Lowest value: 0
Default value: 3

26 DTMF DTMF tones consist of a lower frequency in combination with a higher frequency. The test enables you to listen to either or both as follows:
Press **0** for the low frequency
Press **1** for the high frequency
Press **2** for both frequencies.
The tones are then generated when ▲ and ▼ is pressed. With each new depression of ▲ and ▼ comes a different tone. The display (num. field) shows to which key the tone refers.
Keys with DTMF tones: **0** -**9**, **∗**, **#**. Tone generation is disabled when leaving the test option.
It is also possible to adjust the soft trimmer potentiometers in the LINA circuit. Press **M** & **#** to enable calibration and to display present value in the range from 00 to 1F.

27 TXSRC Control of TX Source switch in LINA. Nominal deviation.
0 : External TX source;
ATMS through-connected to LINA (default)
1 : Internal TX source (MIC SIGNAL).
The test option also enables you to adjust the soft trimmer potentiometers in the LINA circuit. 0 prepares for adjustment of the External, 1 for the Internal Mic Potentiometer:
Press **M** & **#** to enable calibration and display value in the range from 00 to 1F.
Press ▲ or ▼ to change the value.
Press **M** & **S** to store the new value.

28 EARPIECE Controls the Earpiece Mute switch in the LINA circuit.
0 : Internal earpiece disconnected (default)
1 : Internal earpiece connected.
With earpiece connected the test option also permits adjustment of the soft trimming potentiometer in the LINA circuit:
Press **M** & **#** to enable calibration and display present value in the range from 00 to 0F.
Press ▲ or ▼to change the value.
Press **M** & **S** to store the new value.

29 COMP Selects companding or linear mode, where linear mode is the default condition.
Press **M** & **#** for display of actual mode, indicated as follows:
00 : Linear mode / bypass compander
01 : LINA compander, external audio
02 : LINA compander
03 : External compander, companding mode.
To change the mode, press **M** and the respective digit per the above table (omitting the 0).

30 HF Controls the internal HF in the LINA circuit
M & **0** = HF Rx path
M & **1** = HF Tx path

Gain	*dB*
0	0
1	-7
2	-14
3	-21
4	-28
5	-35
6	-42
7	-49

If a path, Rx or Tx, is chosen, a corresponding ADC value is displayed continuously on the AND.
By pressing **M** & **S** it is also possible to calibrate Rx and Tx parameters used by the internal HF. Once calibration has been performed the stored values will be displayed; Tx on AND and Rx on DDD.
Note: LINA and BERTRAM must have been in operation for at least 10 sec before calibration is started.

33 ACCUMLTD Reset of Accumulated Air Timer. Press **M** & **#** to reset. # is shown after completed operation.

34 BAUD This option controls the Baud Rate clock in the CARL circuit as follows:
0 : 600 baud
1 : 1200 baud
2 : 2400 baud
3 : 4800 baud
4 : 9600 baud

36 HI Z (Factory use only). Sets the HI_Z_AFMS port on the LINA circuit.
0 : Output Low (default)
1 : Output High.

38 ADC Displays (alpha-num. field) once a second the value of the Analog/Digital Converters. Select ADC by pressing **M** and the respective digit shown below:
1 : RSSI
2 : BATT
3 : TX VCO
4 : TEMPSENSE (inside mobile)
5 : BTEMP (battery temp.)
6 : HFSENSE.

39 DAC Changes temporarily the output voltage from the Digital/Analog Converters. Select DAC by pressing M and the respective digit as follows:
1 : DAC for adjustment of the DC level for the Tx VCO
2 : DAC for course adjustment of the VCTCXO
3 : DAC controlling the transmission power level.
Change voltage by pressing ▲ and ▼, or by entering a decimal value followed by **M** & **#**.
The initial values will be resumed when leaving the test option.

40 INPORT Shows, once a second, the status on the inports selected by pressing **M** and the corresponding figure, see below.
1 : PWRSRC (on CARL)
0 : Input High (battery)
1 : Input Low (externally powered).
2 : RX LOCK (on BERTRAM)
0 : Input Low
1 : Input High (locked).
3 : TX LOCK (on BERTRAM)
0 : Input Low
1 : Input High (locked).
4 : POWDET
0 : Transmitter Off
1 : Transmitter On
5 : ICAP (on CARL)
0 : Input Low
1 : Input High.
Continued on next page

6 : HF REQ (HOOK) (on CPU)
0 : Input Low
1 : Input High.
7 : RXCD (on CARL); RSSI compared to sensitivity limit
0 : RSSI 0dB limit
1 : RSSI 0dB limit

41 OUTPORT Shows the status on the outports selected by pressing **M** and the corresponding figure, see below.

1 : ICTRL (on CPU)
0 : Output Low
1 : Output High
2 : LSPCTRL (on CPU)
0 : Output Low
1 : Output High
3 : TXON1 (on BERTRAM)
0 : Active
1 : Not active
4 : SWVREG (on BERTRAM)
0 : SWREG On
1 : SWREG Off
5 : VPAON (on BERTRAM)
0 : Not active
1 : Active
6 : VTX (on BERTRAM)
0 : Active
1 : Not active
7 : VRADON (on BERTRAM)
0 : Active
1 : Not active
8 : LED1 (green LED porton CARL)
0 : Not active
1 : Active
9 : LED2 (red LED port on CARL)
0 : Not active
1 : Active
10: ILLUM (on CARL), selected by pressing **0** only,
0 : Not active
1 : Active

42 DSCR MLT Turns on and off the discriminator and the multiplier in the BERTRAM circuit.
0 : OFF
1 : ON

43 BAR
Ringing: Press **0** to activate
Alarm Signal: Press **1** to activate
Click Signal: Press **2** to activate
Error Signal: Press **3** to activate.

44 LCD Controls the LCD contrast via VLCD1 output on the CARL circuit. Entered values, in the range from 00 to FF, as described below:

To enter	Press
0...9	**0**...**9**
A	**M** & **0**
B	**M** & **1**
C	**M** & **2**
D	**M** & **3**
E	**M** & **4**
F	**M** & **5**

45 DSP TEST Pressing **#** causes all display segments to flash. The test is carried out in five steps with different patterns, each pattern shown for 2 seconds. Will continue until **C** is pressed.

46 PWR DOWN The default value "1" provides normal operating mode. Pressing the **0** key sets BERTRAM and LINA in power down mode, and removes power from the compander.

47 PROG NAM Displays the product number and revision status of the EPROM program, when **#** is pressed.

50 GUARANT Displays the guarantee start (year and month), and its duration (months) when **#** is pressed.

54 STARTUP (Factory use only). In this test different parts of the memory can be initiated with default data resident in the program.
M & **S** initiates all Data Areas except the radio parameter area:
- Short Numbers
- Customer Data
- ESN (dummy)
- PIN code
- Current Backup Area

M & **#** initiates the radio parameters (including calibrated values), LINA trimpots, and some of the other trimpots, e.g. Coarse TCXO DAC.
M & ***** initiates the Customer Data Area.
M & **2** initiates default PIN code.
M & **1** initiates the the ESN positions with a dummy number. This option may be used when the ESN positions do not contain a proper ESN number, which causes the telephone to switch off itself.
M & **0** destroys an EE pattern, which will cause Backup Area No. 0, the very first one, to be initiated at the next Power On. Backup area counting will start at 0.

55 WAVE (Factory use only). Selection of square wave or triangle wave generation in BERTRAM. ***00*** on the display indicates square wave, ***01*** triangle wave.
Press **M** & **#** to display actual value. Change by pressing **M** and the alternative figure, **0** or **1**. Press **M** & **S** to store the new value.

56 OSCA (Factory use only). Change of oscillator amplification from BERTRAM.
Press **M** & **#** to enable calibration and to display present value.
Press ▲ or ▼ to change the value.
Press **M** & **S** to store the new value.
Note: Although all values up to 1F are allowed, only the following ones are significant:
1F : 1 1111 (highest amplification)
1E : 1 1110
1C : 1 1100
18 : 1 1000
10 : 1 0000
00 : 0 0000 (lowest amplification)

57 OSCD (Factory use only). Change of oscillator duty cycle from BERTRAM.
Check that the telephone is tuned correctly to a channel and that the HF signal is strong.
Press **M** & 0, and calibration will be performed automatically. The stored value will be displayed on the alphanumeric display.
Alternatively, press **M** & **#** to enable calibration and to display present value in the range from 00 to 7F.
Press ▲ or ▼ to change the value.
Press **M** & **S** to store the new value.

59 LO RXTX (Factory use only). Change of synth. threshold in BERTRAM.
Press **M** & **#** to enable calibration and to display present value in the range from 00 to 7F.
Press ▲ or ▼ to change the value.
Press **M** & **S** to store the new value.

60 CINDY (Factory use only). With this option it is possible to control the circuit by special codes. Cannot be used in Handset mode.

61 LINA (Factory use only). With this option it is possible to control the circuit by special codes. Cannot be used in Handset mode.

62 BERTRAM (Factory use only). With this option it is possible to control the circuit by special codes. Cannot be used in Handset mode.

74 TCATEST Special software test of combining algorithm according to TACS specifications. Press **#** to display:
01 : OK
00 : Fail

76 BATTSAVE Controls the *Reduced Power* function. Enter 0/1 to deactivate/activate. Deactivated is default condition. (valid for PL2 only)

77 EE DATA Factory use only

Table 1. Overview of the Test Program

(default values in *italics*)

Option	Possible Values
1 **Channel Number**	1329-2047, 0-600, *(1)*
2 **Transmission Power**	*8 : 0 W,* 7: min., 2: max.
5 **Power Calibration**	Programs the Power Level positions in EEPROM
9 **RF Calibration**	Setting of RSSI level and max. frequency compensation in the EEPROM
10 **RXSENS**	Sets Audio Gain trimmer in LINA. Change value by ▲ or ▼
12 **Current Calibration**	Ammeter value divided by 700 and multiplied by 30
13 **Battery Calibration**	Memorize supply at 5.3 V, increase to 8.1 V and memorize again (**M**&**S**)
14 **Audio Deviation**	Change value by ▲ or ▼
15 **AFC**	0 : AFC OFF *1 : Normal mode*
17 **MF Count**	Hex. value
18 **VCO Calibration**	Press **M**&**0** for aut. cal.
19 **RX SAT**	Displays frequency of received SAT
20 **Audio**	0 : Paths to and from handset (hs) closed 1 : Path to hs closed; from hs open 2 : = 1: reversed 3 : both paths open
21 **Handset**	*0 :Mic. & earphone OFF, speaker OFF* 1 :Mic. & earphone ON, speaker OFF 2 :Mic. & earphone OFF, speaker ON
22 **TX SAT**	0 : 5970 Hz 1 : 6000 Hz 2 : 6030 Hz 3 : no SAT *4 : SAT switch in LINA ON* 5 : SAT switch in LINA OFF

Table 1. Overview of the Test Program, cont'd

Option	Possible Values
23 **Manchester Out**	Sets Tx data patterns
24 **Manchester In**	Displays channel type and received data when **#** is pressed
25 **Volume**	0-7, *3* default, 7 max.
26 **DTMF**	DTMF tones on **0**-**9**, *****, **#**
27 **TX Source**	*0 : External*, 1: internal
28 **Earpiece**	*0 : Internal earpiece Off*, 1: On
29 **Compander**	***M***&***3***: *ext. comp. (companding mode)* **M**&**2:** LINA compander **M**&**1**: LINA comp. external radio **M**&**0**: Linear mode
30 **HF**	Controls internal HF in LINA.
33 **Accumulated Air Time**	**M**&**#** to reset
34 **BAUD**	0 : 600; 1 : 1200, 2 : 2400; 3 : 4800; 4 : 9600 baud
38 **ADC**	**M**&**1**: RSSI, **M**&**2**: Batt, **M**&**3**: reflected Tx pwr, **M**&**4**: Tempsense, **M**&**5**: Btemp.
39 **DAC**	**M**&**1**: DAC1, **M**&**2**: VCTCXO, **M**&**3**: POWLEV
40 **INPORT**	**M**&**1**: PWRSRC, **M**&**2**: RX LOCK, **M**&**3**: TX LOCK, **M**&**4**: POWDET, **M**&**5** BATTCAP, **M**&**6**: ICAP, **M**&**7**: HF REQ
41 **OUTPORT**	**M**&**1**: ICTRL, **M**&**2**: LSPCTRL, **M**&**3**: TXON1, **M**&**4**: SWVREG, **M**&**5** VPRON, **M**&**6**: VTX, **M**&**7**: VRAON, **M**&**8**: LED1, **M**&**9**: LED2, **M**&**10**:ILLUM
42 **DSCR MLT**	0 : Discr. & Multiplier OFF 1 : Discr. & Multiplier ON
43 **BAR**	Press 0 for Ringing, 1 for Alarm, 2 for Click, 3 for Error signal

Table1. Overview of the Test Program, cont'd

Option	Possible Values
44 **LCD**	LCD contrast. Enter 00-FF; **M**&**0** for A, **M**&**1** for B, **M**&**2** for C, etc.
45 **Display Test**	Press **#** for test
46 **Power Down**	0-1, 0 : normal, *1 : power down*
47 **Program Name**	Press **#** for information
50 **Guarant**	Guarantee information presented
74 **TCA Test**	01: OK 00: Fail
76 **BATTSAVE**	Press **0** to deactivate, **1** to activate
99 **Exit**	Returns to normal program

Additional Tests

Autonomous timeout, if the operator:

- removes the +5 V supply from the VPPFLASH input,
- activates the transmitter, and
- ensures that no RF signal is received, the telephone switches off after about 30 seconds.

Voltage guard: the telephone switches off if the power supply drops below 5.3 V ± 0.1 V. This can be tested by successively reducing the supply voltage to the telephone.

Appendix C: Service Program ETACS

Contents

General

This version of the ***Service Program ETACS Products*** is a final release, intended for entering the initialising customer parameters into the EEPROM of the ***Ericsson Handheld Telephone 1341-B***. Even if you are familiar with earlier versions of Service Program ETACS Products you must apply the instructions given below, since there are changes on a number of points.

Hardware Requirements

The ***Service Program ETACS*** is designed to run on an *IBM PC, XT/AT, PS/2,* or fully compatible computer, with DOS-version 2.00 or higher. Connection is made via Programming Interface KRY 101 1137 and Programming Cable KRY 101 1135/7.

Note: The Programming Interface, KRY 101 1137, must be connected to COM-port 1 or COM-port 2 of the computer.
If you are using a computer with a 9-pin serial connector, you will also need a 9-to-25 pin adapter (not supplied by Ericsson).

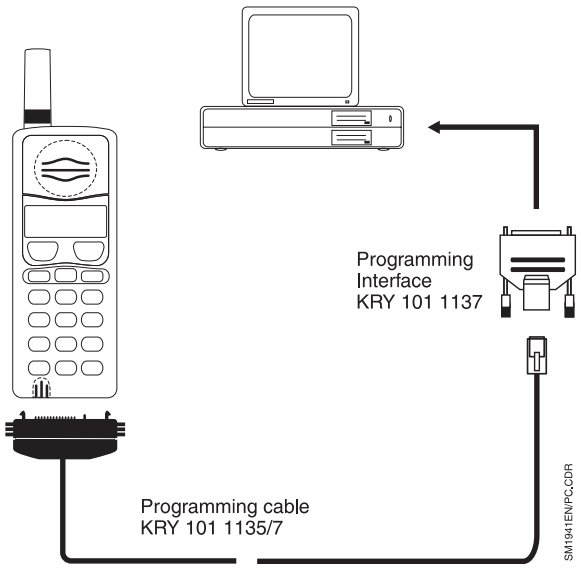


Figure 1. Telephone connected to a PC.

Software Installation

The software on the diskette ***Service Program ETACS*** consists of four files:

SPEP1341.EXE
TYPE1341.MNU
TYPE1341.EDT
TYPE1341.CNF

You can install the software on a hard disk simply by copying the diskette contents to a suitable directory on the hard disk.

For example:

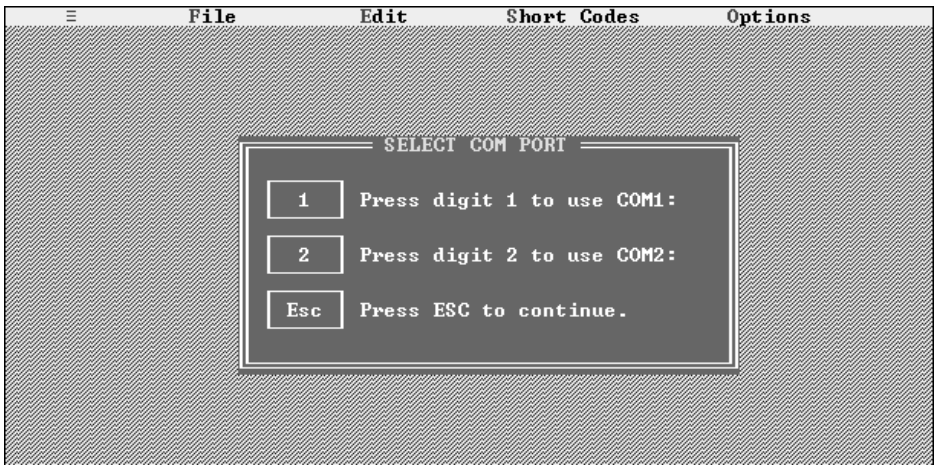
C:
C:\MD SPEP1341
C:\CD SPEP1341
C:\SPEP1341COPY A: *.*

If you are using a PC without a hard disk, you may run the program directly from the supplied diskette, but we advise you to make a copy of this diskette. Use either the DOS-command *COPY* or *DISKCOPY* to create a backup. Put away the original diskette and use the backup copy.

Caution: *Since the programming interface is powered by the mobile telephone, make sure that the battery is fully charged. Using even slightly discharged batteries may produce unpredictable results, even if the Low Battery warning has not yet appeared.*

Starting the Program

The service program will fetch *today's date* from the system clock of the PC. To check the date, type **DATE** after the DOS-prompt and press **Enter**. Start the program by typing **SPEP1341** if your monitor is a colour monitor, **SPEP1341 /M** if you have a monochrome monitor connected to a colour video board. Press **Enter**/**Return**, and the **Com Port** menu appears on the screen:



Following the instructions on the screen you select the serial port where the Programming Interface is connected (COM1 or COM2).

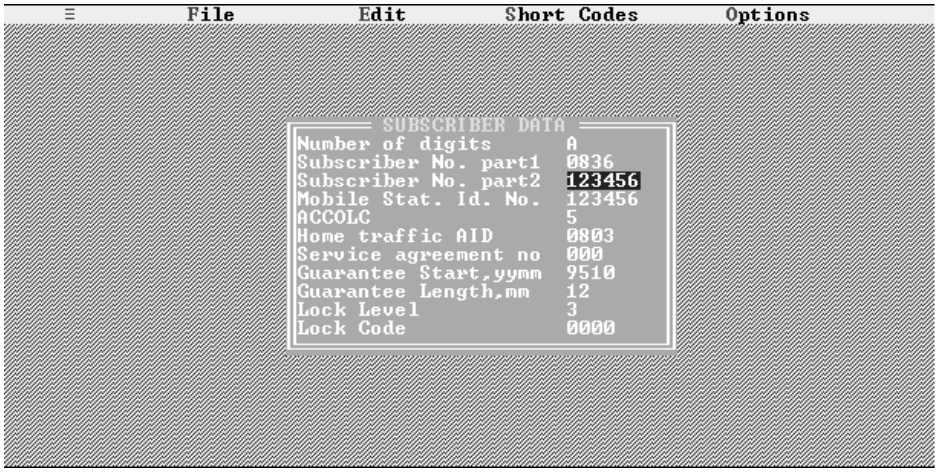
The selection of the COM port can also be done at the DOS-prompt, e.g. SPEP1341/COM1; if so, the initial menu will not appear on the screen.

***Note**: If you have a serial mouse, and you select the COM-port where the mouse is connected you may lock up your computer. If this happens, restart the computer.*

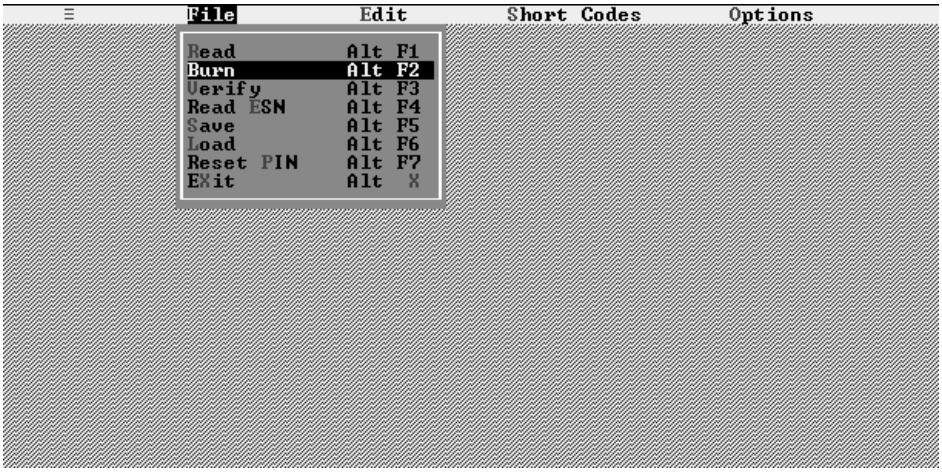
The Programming Cycle

Details of the different entries are given in ***Using the Menus***. Below is a brief description of the main events.

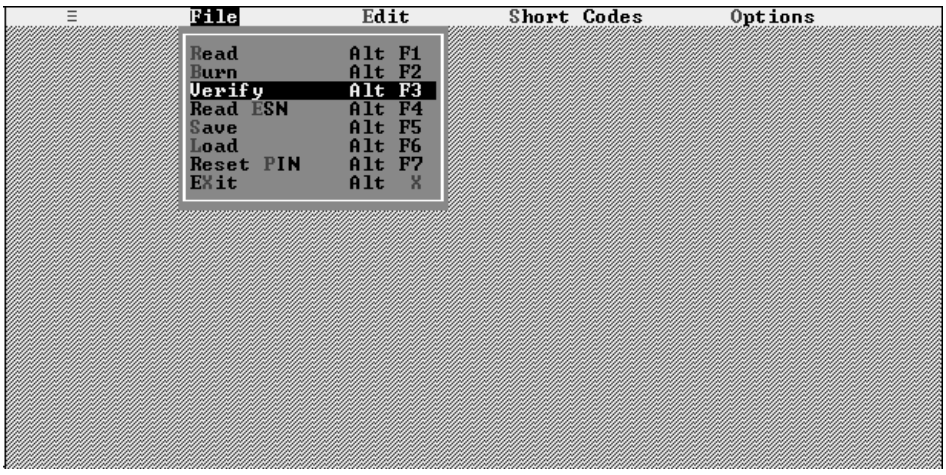
After selection of the COM port the ***Subscriber Data*** editing window is automatically displayed. For most customers you will only need to enter data in this window. You will move the cursor by the arrow keys of your PC, or click the mouse on the respective field of the window. You can return to the main menu on the top row of the screen by the **Esc** key.



When you are ready to *program* (transfer the data into the EEPROM of) *the telephone*, press **F2** while keeping the **ALT**-key depressed. You will be asked to confirm by pressing the **Y**-key.



After programming you can verify the result by pressing **ALT F3**.



To exit the program hold down the **ALT**-key and press the letter **X**. You can also exit the program when using the menus, see below.

Using the Menus

How to Select

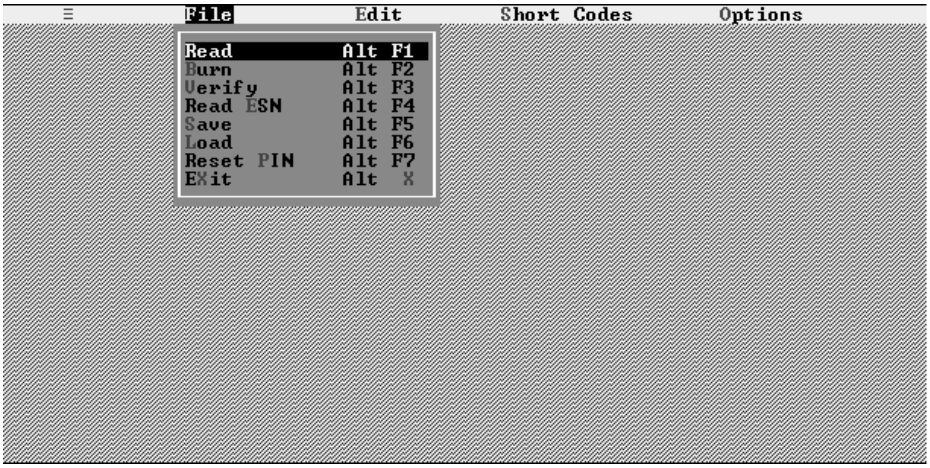
Press **Esc** to reach the menu. From a 'Data edit window' you can also go directly to a sub-menu by holding down the **ALT** key and pressing the highlighted letter in the main menu (e.g. **ALT F** to go to ***File*** functions).

Move the selection bar (reverse video) to the left or right by the keypad arrow keys. Press **Enter** to open a sub-menu (if it is not open already). In the sub-menu you can move the selection bar up or down by the arrow keys. Press **Enter** to activate the selected function, or **Esc** to return to the main menu.

The Functions

File

In most cases, after performing any of the ***File*** functions below, the program will automatically return to the ***Subscriber Data*** edit window.



Read — This function will transfer the contents of the EEPROM to the memory of your computer. You can inspect and change the contents using the edit windows.
Caution: If you use this function, make sure that you re-load the configuration file before programming other telephones. Otherwise you might inadvertently program incorrect data.

Burn — This function will *program* into the connected telephone the Subscriber, Country and System data that has been entered into the memory of your PC.

Verify — A comparison is made between your PC's memory and the connected telephone.

Read ESN — Reads the electrical serial number programmed into the connected telephone. It is possible to read the decimal as well as the hexadecimal format of the ESN.

Save This command has two different functions:

1. It creates a configuration file which is then automatically loaded at each program start. You ***must*** change the file name manually to **TYPE1341.CNF**. All data from all edit windows are saved**.**

The Guarantee Start will always be default to today's date as set by the system clock.

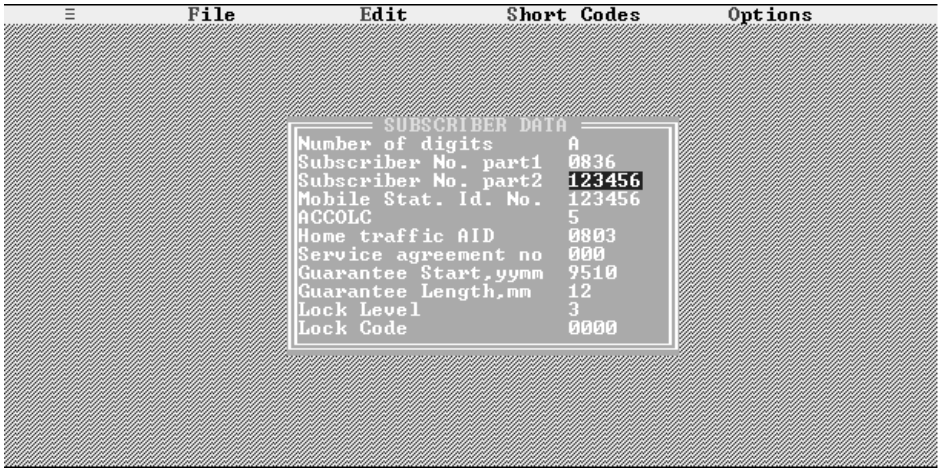
2. Saves the data in the telephone before service. All data in the edit windows is saved if the file name is other than TYPE1341.CNF. The default name is STATION1.SAV.

Load This function will reload a configuration file.

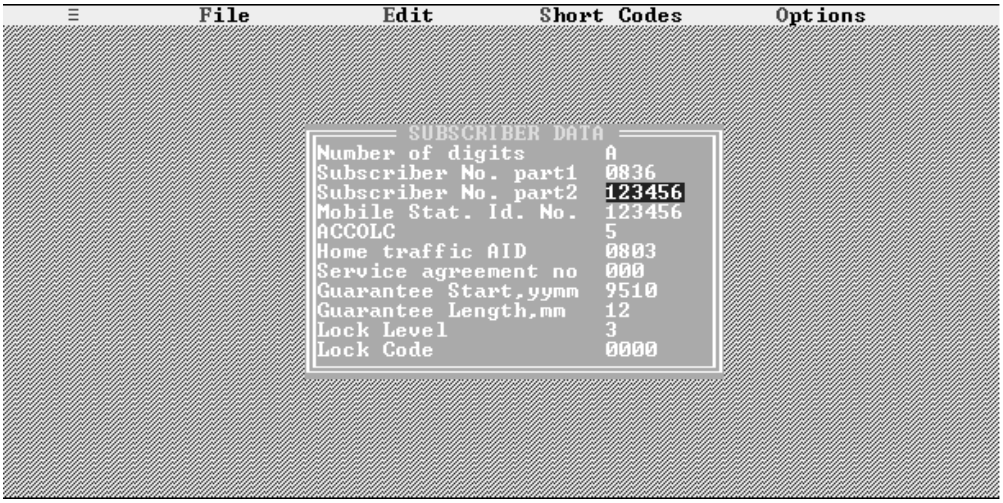
Exit Quit the program.

Edit

When leaving the ***File*** menu you will automatically have the ***Edit*** menu displayed, and you may select either of the editing windows, ***Subscriber Data, Facilities etc.***



Subscriber Data



Number of digits
The subscriber number consists of a max. 10-digit number. The user may want only part of it to be displayed. Enter **A** (=10) for full display or **0** to **9** for the reduced number of digits, counted from the end digit.

Subscriber No. Part 1/Part 2
The Subscriber No. is information to the user and is NOT used by the system.

Mobile Stat. Id. No.
The 6 least significant digits of the international mobile station number, in most countries equal to the 6 least significant digits of the subscriber number.

ACCOLC
The Access Overload Class, normally the last but one digit of the mobile station identification number.

Home traffic AID
The home traffic area identification in hex. code.

Service Agreement No.
Store reference number if needed.

Guarantee Start, yymm
Will be read from the PC's system clock at program start, but can be changed to any date.

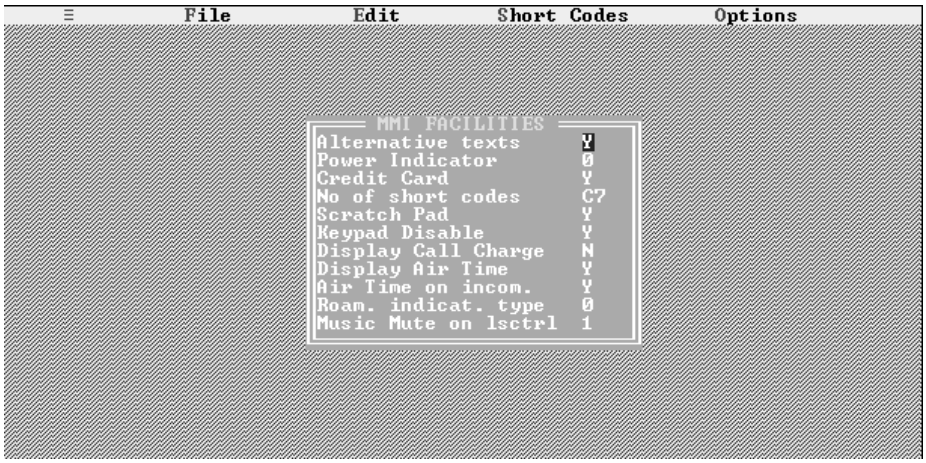
Guarantee Length, mm
Should be used together with the ***Guarantee Start.***

Lock Level
0 = Locking facility disabled.
1 = Locking at level ALL and INTER permitted.
2 = Locking at level PRIV and INTER permitted.
3 = Locking permitted at level ALL, PRIV and INTER.

Lock Code
Subscriber's four-digit lock code. Must initially be set to 0000 to agree with the ***User's Manual***.

Subscriber Features

The Subscriber Features are defined with the aid of two items that can be selected in the ***Edit*** menu. The items are ***MMI Facilities*** and ***MMI Menus***. In most cases you can use the standard settings, but for some customers changes may be necessary.



Alternative Texts
Should always be set to Y.

Power Indicator
0 : Output power indicator disabled.
1 : ICTRL and PL will be displayed.
2 : SAT and PL will be displayed.
The indicators can only be displayed if the channel indicator facility is enabled.
Note: This function is only used for system tests and should **NOT** be enabled for ordinary customers.

Credit Card
Y = Hidden Credit Card facility enabled.
N = Hidden Credit Card facility disabled.

No. of Short Codes
The max. number of Short Codes available to the defined user. The value should be entered in hexadecimal form (range 00-C7), normally set to C7.

Scratch Pad
Y = Scratch Pad facility enabled.
N = Scratch Pad facility disabled.

Keypad Disable
Y = Keyboard Lock facility enabled.
N = Keyboard Lock facility disabled.

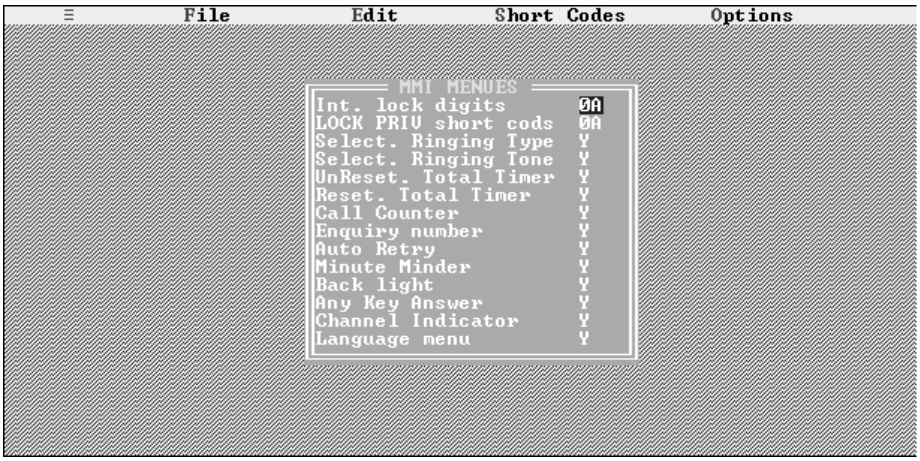
Display Call Charge
Y = During a call, after a call, and in the Special Functions the Call Charges are displayed in minutes.
N = Call Charges display disabled.
Note: Only for payphone subscribers.

Display Air Time
Y = During a call, after a call, and in the Special Functions the Air Time is displayed in minutes.
N = Air time display disabled.
Note: If both Call Charges and Air Time are set to "Y", the Call Charges will be used.

Air Time on incom.
Y = The Air Time will be also be counted for incoming calls.
N = Air Time meter for outgoing calls only.

Roam Indic. Type
0 : Normal Roaming indication.
1 : Special Roaming indication.

Music Mute on Isctrl
0, 1 : Music Mute only on serial channel.
2: Lspctrl pin equals Music Mute function.



Int. Lock Digits
Hexadecimal value stating max. number of entries at LOCK INTER.

LOCK PRIV Short Nos
Hexadecimal value stating number of available shortnumbers when locked PRIV.

Select. Ringing Type
Y = Ringing volume selection LOW, MED, HIGH, STEP and OFF enabled.
N = Ringing volume selection disabled.

Select. Ringing Tone
Y = Ringing tone selection LOW, MED, HIGH and MIXED enabled.
N = Ringing tone selection disabled.

UnReset. Total Timer
Y = Total Timer enabled (ACCUM xxxx).
N = Total Timer disabled.

Reset. Total Timer
Y = Resettable Total Timer enabled (TOTAL xxxx).
N = Resettable Total Timer disabled.

Call Counter
Y = Number of outgoing calls can be read in the ***Special Functions*** mode.
N = Call Counter facility disabled.

Enquiry Number
Y = Enquiry Number facility enabled.
N = Enquiry Number facility disabled.
Note: An Enquiry Number must be programmed in the ***Country Data*** window.

Auto Retry
Y = Automatic re-try on ***Network Busy*** enabled.
N = Automatic re-try on ***Network Busy*** disabled.

Minute Minder
Y = Minute Minder facility enabled; user can be alerted at the beginning of each air-time minute.
N = Minute Minder facility disabled.

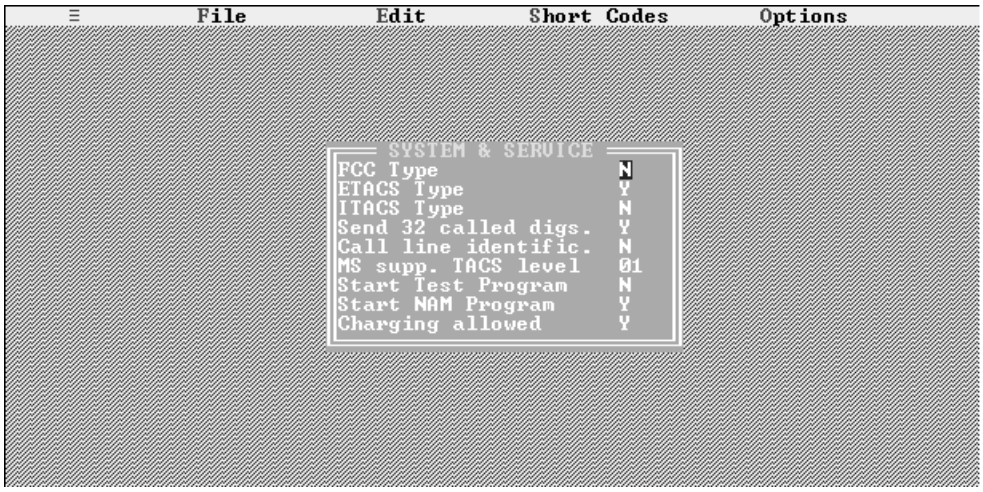
Back Light
Y = Backlight can be turned off permanently
N = Backlight controlled by software.

Any Key Answer
Y = Any Key Answer facility enabled.
N = Any Key Answer facility disabled.

Channel Indicator
Y = Channel Indicator facility enabled.
N = Channel Indicator facility dusabled.
Normally, the channel indicator is displayed together with the battery meter, see the above description of Power Indicator.

Language Menu
Y = Local language can be selected.
N = Only English texts available, unless another language has been selected in the local language menu.

System & Service



FCC Type
Not used. Should be set to N.

ETACS Type
Here is defined if the telephone is an ETACS type.
Note: This position should be set to **N** if the telephone is a TACS only type.

ITACS Type
Here is defined if the telephone is an ITACS type.
Note: This definition is used in combination with the ETACS type.

Send 32 Called digs.
Y = Possible to use up to 32 digits for outgoing calls.
N = Only up to 16 digits can be used for outgoing calls.

Call Line Identific.
Y = CLI functions enabled.
N = CLI functions disabled.

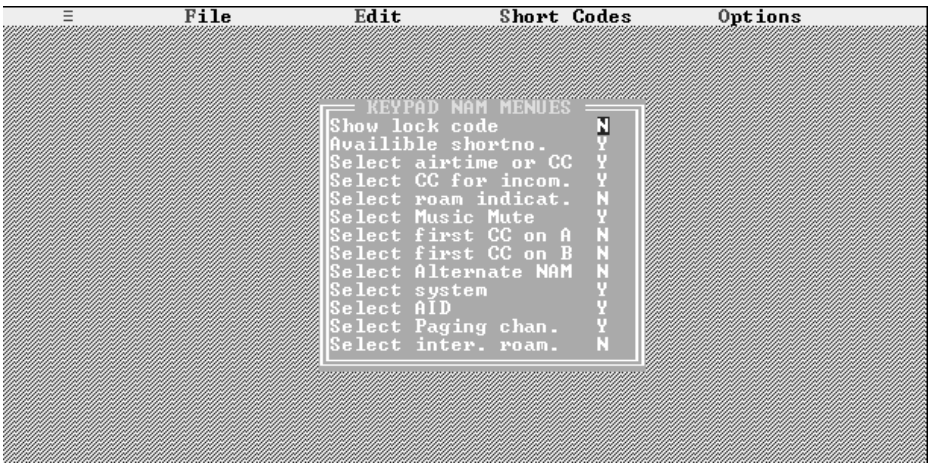
MS Supp. TACS Level
Here is defined the TACS level supported by the telephone, normally set to 00.
00 if TACS
01 if TACS-2.

Start Test Program
Y = The test program can be accessed by entering a special code on the keypad.
N = The test program cannot be accessed from the keypad.

Start NAM Program
Y = The internal NAM progam can be accessed by entering a special code on the keypad.
N = The NAM program cannot be accessed from the keypad.

Charging Allowed
Y = The ICTRL pin of the system connector will be used to charge the battery when powered externally.
N = Charging will not be performed when external power is supplied.

Keypad NAM Menus



Show Lock Code
Y = The Lock Code menu will be shown
N = The menu will not be shown

Available Short Codes
Y = The max. number of available Short Codes when locked PRIV can be programmed.
N = The menu will not be shown and cannot be programmed

Select Air Time or CC.
Y = The Air Time and Call Cost menus will be shown; one to be selected.
N = The menus will not be shown and cannot be programmed

Select CC for incom.
Y = Only Out and menus will be shown; one to be selected.
N = The menus will not be shown and cannot be programmed.

Select Roam Indicat
Y = Roam Type 0 and Roam Type 1 menus will be shown; one to be selected.
N = The menus will not be shown and cannot be programmed.
Note: Normally the Roam Type 0 is to be selected.

Select Music Mute
Y = Music Mute menus will be shown; one to be selected.
N = The menus will not be shown and cannot be programmed.

Select First CC on A
Y **=** The FCCH A menu will be shown and the first control channel in system A can be programmed.
N **=** The menu will not be shown and cannot be programmed.

Select First CC on B
Y **=** The FCCH A menu will be shown and the first control channel in System B can be programmed.
N **=** The menu will not be shown and cannot be programmed.

Select Alternate NAM
Y = The NAM 2 data can also be programmed.
N **=** Only the NAM 1 data can be programmed.

Select System
Y **=** Either System A or System B can be selected.
N **=** The system cannot be selected.

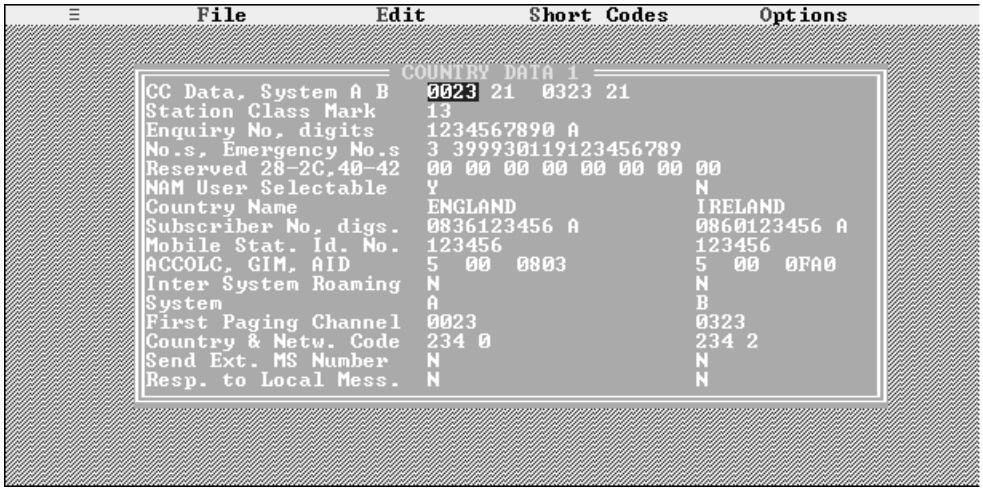
Select AID
Y **=** The AID menu will be shown and can be programmed.
N **=** The menu will not be shown and cannot be programmed.

Select Paging Chan.
Y **=** The IPCH menu will be shown and the initial paging channel can be programmed.
N **=** The menu will not be shown and cannot be programmed.

Select Inter. Roam.
Y **=** The NO ROAM and ROAM menus will be shown and one is to be selected.
N **=** The menus will not be shown and cannot be programmed.

NAM & Country Windows 1 - 4

These items contain data for all four countries; NAM and country data in one window. Be sure to set these items correctly for the respective country.



CC Data, System A B
Defined are here the first control channels and the number of control channels for both system A and B. Values are to be entered in decimal form.

Station Class Mark
Here the station class mark is defined, always to be set at 13_{HEX}.

Enquiry No, Digits
Here the enquiry number and the number of digits in the enquiry number, counted from the end, are defined.

No.s, Emergency No.s
Here are defined the number of emergency numbers and the emergency numbers. The emergency number should be entered as shown in the example below (three emergency numbers, 90000, 911, 011). Before each emergency number the length of the number is defined:
Example: 3 590000391130110000.

NAM User Selectable
Y = The NAM can be selected by the user in the *Special Functions* menu.
N = The NAM cannot be selected.
Note: The first NAM must always be enabled.

Country Name
If the name contains less than ten letters, the remaining positions can be left blank.
Note: This name will only be shown in the ***Special Functions*** if the telephone is programmed as an ITACS type.

Subscriber No. Digs
The subscriber number consists of a max. 10-digit number. The user may want only part of it to be displayed. Enter **A** (=10) for full display or **0** to **9** for the reduced number of digits, counted from the end digit. The subscriber no. is information to the user and is NOT used by the system.

Mobile St. Id. No.
The 6 least significant digits of the international mobile station number, in most countries equal to the 6 least significant digits of the subscriber number.

ACCOLC, GIM, AID
The Access Overload Class, normally the last but one digit of the mobile station identification number.
The Group Identification Mark (not used).
The home traffic area identification in hex. code.

Inter System Roaming
Y **=** Inter System Roaming enabled.
N **=** Inter System Roaming disabled.

System
A = System A is the home system in the NAM.
B = System B is the home system in the NAM.

First Paging Channel
Definition of the first paging channel in the present NAM. Value to be entered in decimal form.

Country & Network Code
Defined are here the Mobile Country Code, 3 digits, and the Mobile Network Code, 1 digit, for the present NAM.

Send Ext. MS Number
Here is defined if the telephone must send the extended address word when accessing the system.

Resp. to Local Mess.
Here is defined if the telephone is to respond to local control messages sent on the FOCC.

Short Codes

Save To Disk This function will read the short codes from the telephone and transfer them into a file, see below.

Load From Disk This function will read short codes from a file and store (burn) them in the telephone, see below.

Clear Mobile This function will clear all short codes in the telephone.

Options

COM Port Here you can change the COM-port whithout leaving the program, for example, if you have programming interfaces connected to both COM-ports.

Re-programming a Telephone

If you want to make changes to a telephone that has already been programmed, first read the EEPROM by pressing **ALT F1**. Then perform the desired changes, and program the EEPROM by pressing **ALT F2**. Verify by pressing **ALT F3**.

Note: Make sure that you re-load the configuration file before programming other telephones. Otherwise you may inadvertently program incorrect data.

Preparing Dealer Programs

This software release supports the creation of ordinary configuration files, but no other dealer program preparation.

The Contents of Saved Shortcode Files

The *Save* file is a normal text file which may be edited by any word processor or text editor. It is possible to create a file independently from the program, and then use the program for transferring it to the telephone. The file does not have to list the short codes in any particular order, and it is not necessary to supply all 199 numbers.

You can, for example, create a file with only three short codes at positions 21, 22 and 23, and add these to a telephone that already has some codes programmed.

Each line of the file should have the following form:

First one or two figures to represent the Short Code positions from 1 through 199. Then the name of the subscriber, maximum 10 characters, letters and digits. And finally the telephone number of no more than 16 or 32 characters (depending on what the system can manage). Numbers **0**-**9**, ***** and **#** are allowed.

For example:

001 ERICSSON 0094646181000
002 JOHN DOE 12345678
003 TRANSFER *21*9171234567#

A line containing only text, NO NUMBERS, is a comment and will not cause any programming of the telephone.
A line containing only the position will erase that shortcode.
Like this:

004
005
006

Appendix D: Keypad NAM Programming

Contents

General

NAM programming from the keypad is described below with text as well as with a flow chart. Basically, NAM programming means entering the optional data that specify communication parameters, enabled functions etc. applying to the individual telephone. When an option is entered, the current setting is displayed, and either by toggling between different alternatives or by entering numeric data the NAM data is programmed.

Activation

The NAM programming is activated either by entering a special code on the keypad or by using the Service Program.

Exit

When the text EXIT is displayed the **END** button should be pressed to exit the keypad NAM programming.

Menu Restrictions

The keypad NAM programming can be customized by the sales companies and therefore some options might not be possible to alter. In the below flow chart this possibility is indicated in the different options with a * at the upper left corner.

Button Functions

M

The **M** button is used to restart the NAM programming from the beginning. ***Note:*** Changes at the present option or setting will not be stored when the **M** button is pressed.

Arrow Up

The ▲ button is used to confirm an option or when numeric data is fully entered. When this button is pressed following options might be omitted if they are not valid or if restrictions do not allow alteration.

Arrow Down

The ▼ button is used to restore the current option, if a numeric value has been entered, the previous value is restored.

END

The **END** button is used to exit from the NAM programming and can be pressed any time.

Note: To exit from the NAM programming correctly the **END** button should only be pressed when the text ***EXIT*** is shown in the display.

Digits

The numeric buttons are used to program numeric data, such as the telephone number, the area code and channel numbers. The buttons are also used to toggle between alternatives.

C

The **C** button is used to clear a numeric value in a menu, when the menu is entered, the button can also be used to clear single digits.

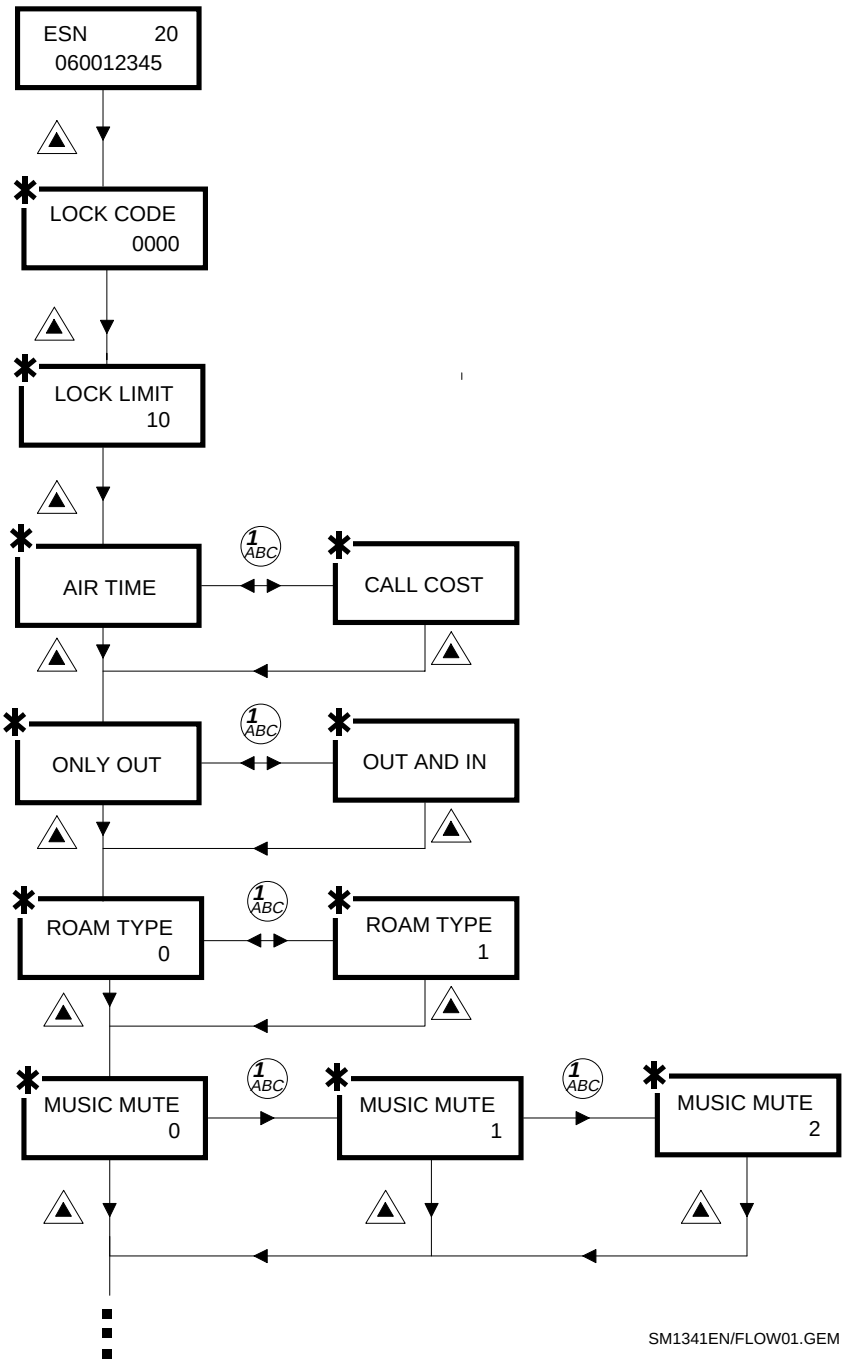
S

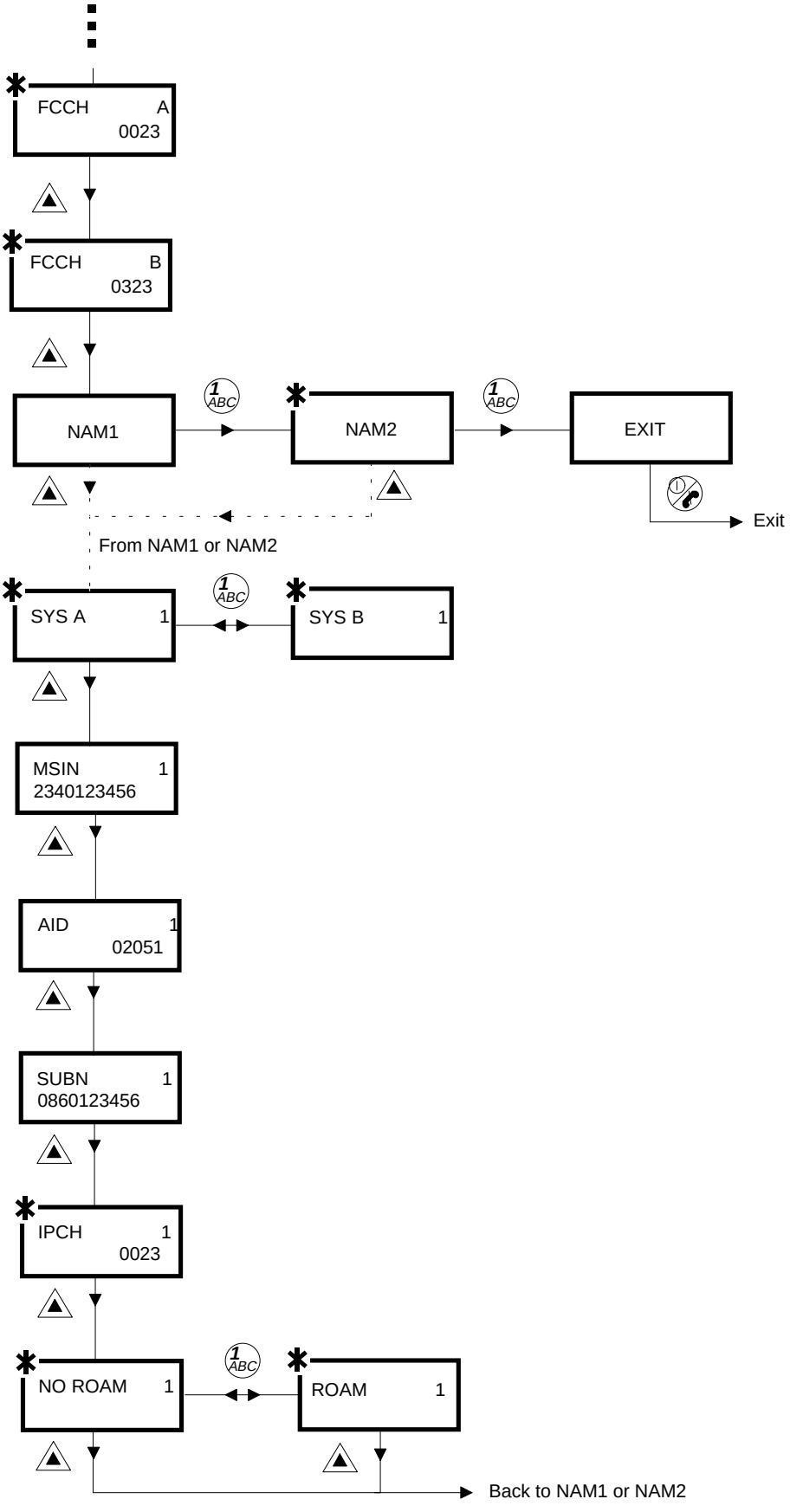
The **S** button can also be used to confirm an option or when a numeric value is fully entered, but the ▲ button should be used instead, as it can be used always while the **S** button only works with some of the options.

Flow Chart

The flow chart describes NAM programming from the keypad. Use the ▲ button to select an option or to confirm that a numeric value has been fully entered. The key symbol **1/ABC** means that a digit key is to be pressed to toggle between alternatives, or to proceed to the next, as indicated by arrows.

A star is used to indicate that default values can be programmed by the factory according to directions from the sales company.




FCCH A
0023
FCCH B
0323
NAM1
1 ABC
NAM2
1 ABC
EXIT
Exit
From NAM1 or NAM2
SYS A 1
1 ABC
SYS B 1
MSIN 1
2340123456
AID 1
02051
SUBN 1
0860123456
IPCH 1
0023
NO ROAM 1
1 ABC
ROAM 1
Back to NAM1 or NAM2
SM1331EN/FLOW02.GEM

The Options

Electrical Serial Number

Displayed text: ***ESN***

Displayed data: The eleven digits electrical serial number, where the two first digits are shown on the upper part of the display and the last digits on the lower part of the display.

Description: The electrical serial number uniquely identifies the hand-held telephone to a cellular system. It is factory set and cannot be changed.

Possible buttons: ▲ :Next menu
END : Exit NAM programming.

Lock Code

Displayed text: ***LOCK CODE***

Displayed data: The four digit electronic lock code of the telephone.

Description: The lock code is only presented, but can be changed with the ordinary functions of the telephone.

Possible buttons: ▲ :Next menu
M : Restart NAM programming
END : Exit NAM programming.

Lock Limit

Displayed text: ***LOCK LIMIT***

Displayed data: Number of memory locations allowed to be recalled when the telephone is in LOCK PRIV mode.

Description: See "Displayed data".

Possible buttons: **0-9** : Enter value between 0 and 99
C : If pressed before digits have been entered the whole display will be cleared, else single digits.
▲ : Next menu
▼ : Restore value
M : Restart NAM programming
END : Exit NAM programming.

Air Time Meter

Displayed text: ***AIR TIME***

Description: The duration of calls will be displayed in minutes during and after a call.

Possible buttons: **0-9**, *****, **#** : Next alternative
▲ : Next menu
▼ : Restore setting
M : Restart NAM programming
END : Exit NAM programming.

Call Charge

Displayed text: ***CALL COST***

Description: The duration of calls will be displayed as actual cost during and after a call.

Possible buttons: **0-9**, *****, **#** : Next alternative
▲ : Next menu
▼ : Restore setting
M : Restart NAM programming
END : Exit NAM programming.

Air Time on Outgoing Calls

Displayed text: ***ONLY OUT***

Description: The air time will only be measured for outgoing calls.

Possible buttons: **0-9**, *****, **#** : Next alternative
▲ : Next menu
▼ : Restore setting
M : Restart NAM programming
END : Exit NAM programming.

Air Time on Incoming and Outgoing Calls

Displayed text: ***OUT AND IN***

Description: The air time will be measured both for outgoing and incoming calls.

Possible buttons: **0-9**, *****, **#** : Next alternative
▲ : Next menu
▼ : Restore setting
M : Restart NAM programming
END : Exit NAM programming.

Roaming Indication, Alternative 0

Displayed text: ***ROAM TYPE 0***

Description: Normal roaming indication. This should be used if nothing else is stated.

Possible buttons: **0**-**9**, ∗, **#** : Next alternative
▲ : Next menu
▼ : Restore setting
M : Restart NAM programming
END : Exit NAM programming.

Roaming Indication, Alternative 1

Displayed text: ***ROAM TYPE 1***

Description: Roaming indication when AID_p AID_s.
This setting is normally not used.

Possible buttons: **0**-**9**, ∗, **#** : Next alternative
▲ : Next menu
▼ : Restore setting
M : Restart NAM programming
END : Exit NAM programming.

Music Mute, Alternative 0

Displayed text: ***MUSIC MUTE 0***

Description: The Music Mute function is controlled via the serial channel with codes.

Possible buttons: **0**-**9**, ∗, **#** : Next alternative
▲ : Next menu
▼ : Restore setting
M : Restart NAM programming
END : Exit NAM programming.

Music Mute, Alternative 1

Displayed text: ***MUSIC MUTE 1***

Description: The Music Mute function is controlled via the serial channel with codes.

Possible buttons: **0**-**9**, ∗, **#** : Next alternative
▲ : Next menu
▼ : Restore setting
M : Restart NAM programming
END : Exit NAM programming.

Music Mute Alternative 2

Displayed text: ***MUSIC MUTE 2***

Description: The Music Mute function is controlled via the LSPCTRL signal on the system connector.

Possible buttons:
0-9, ∗, **#** : Next alternative
▲ : Next menu
▼ : Restore setting
M : Restart NAM programming
END : Exit NAM programming.

First Control Channel for System A

Displayed text: ***FCCH A***

Displayed data: Four digits for first control channel in system A.

Description: The numeric value must contain four digits, with leading zeros.

NOTE: There is NO range checking of the entered value.

Possible buttons:
0 - 9 : Enter value
C : If pressed before digits have been entered the whole display will be cleared, else single digits.
▲ : Next menu
▼ : Restore value
M : Restart NAM programming
END : Exit NAM programming

First Control Channel for System B

Displayed text: ***FCCH B***

Displayed data: Four digits for first control channel in system B.

Description: The numeric value must contain four digits, with leading zeros.

NOTE: There is NO range checking of the entered value.

Possible buttons:
0 - 9 : Enter value
C : If pressed before digits have been entered the whole display will be cleared, else single digits.
▲ : Next menu
▼ : Restore value
M : Restart NAM programming
END : Exit NAM programming

NAM 1

Displayed text: ***NAM1***

Description: Menu to enter the first NAM data area.

Possible buttons:
0-9, *, **#** : Next alternative
▲ : Enter NAM data area
M : Restart NAM programming
END : Exit NAM programming.

NAM 2

Displayed text: ***NAM2***

Description: Menu to enter the second NAM data area.

Possible buttons:
0-9, *, **#** : Next alternative
▲ : Enter NAM data area
M : Restart NAM programming
END : Exit NAM programming.

Exit From the NAM Programming

Displayed text: ***EXIT***

Description: This is the menu where to exit from the NAM programming correctly.

Possible buttons:
END : Exit NAM programming.

System A Selection

Displayed text: ***SYS A 1***

Description: System A will be used for the current NAM data area, 1 or 2. The NAM area is indicated in the upper right position of the display as 1 or 2.

Possible buttons:
0-9, *, **#** : Next alternative
▲ : Next menu
▼ : Restore setting
M : Restart NAM programming
END : Exit NAM programming.

System B Selection

Displayed text: ***SYS B 1***

Description: System B will be used for the current NAM data area, 1 or 2. The NAM area is indicated in the upper right position of the display as 1 or 2.

Possible buttons:
0-9, *, **#** : Next alternative
▲ : Next menu
▼ : Restore setting
M : Restart NAM programming
END : Exit NAM programming.

Mobile Station Identification Number

Displayed text: ***MSIN 1***

Displayed data: The ten digits MSIN consisting of three parts: 3 digits MCC, 1 digit MNC, and 6 digits subscriber number.

Description: The MSIN is used when the telephone is accessing the system.

Possible buttons:
0-9 : Enter value
C : If pressed before digits have been entered the whole display will be cleared, else single digits.
▲ : Next menu, can only be pressed when the all ten digits have been entered.
▼ : Restore value
M : Restart NAM programming
END : Exit NAM programming

Home Traffic Area

Displayed text: ***AID 1***

Displayed data: Five digits home traffic area.

Description: The home traffic area, decimal value, that is used for roaming indication.

Possible buttons:
0-9 : Enter value
C : If pressed before digits have been entered the whole display will be cleared, else single digits.
▲ : Next menu, can only be pressed when the all ten digits have been entered.
▼ : Restore value
M : Restart NAM programming
END : Exit NAM programming

Subscriber Number Information

Displayed text: ***SUBN 1***

Displayed data: A subscriber number with one to ten digits.

Description: The subscriber number is only used as an information for the subscriber and NOT used by the system.

Possible buttons:

0-9 :	Enter value
C :	If pressed before digits have been entered the whole display will be cleared, else single digits.
▲ :	Next menu, can only be pressed when one or more digits have been entered.
▼ :	Restore value
M :	Restart NAM programming
END :	Exit NAM programming

Initial Paging Channel

Displayed text: ***IPCH 1***

Displayed data: Four digits initial paging channel.

Description: The initial paging channel must consist of four digits, with leading zeros.

NOTE: There is NO range checking of the entered value.

Possible buttons:

0-9 :	Enter value
C :	If pressed before digits have been entered the whole display will be cleared, else single digits.
▲ :	Next menu, can only be pressed when the all ten digits have been entered.
▼:	Restore value
M :	Restart NAM programming
END :	Exit NAM programming

Inter System Roaming Disabled

Displayed text: ***NO ROAM 1***

Description: True roaming is not allowed on the complementing system.

Possible buttons:

0-9, ∗, **#** :	Next alternative
▲ :	Next menu
▼ :	Restore setting
M :	Restart NAM programming
END :	Exit NAM programming.

Inter System Roaming Enabled

Displayed text: ***ROAM 1***

Description: True roaming is allowed on the complementing system.

Possible buttons:

0-**9**, ∗, **#** :	Next alternative
▲:	Next menu
▼ :	Restore setting
M :	Restart NAM programming
END :	Exit NAM programming.

Appendix E: ESN Transfer

The ESN Transfer information is distributed separately

Appendix F: Flash Programming

Contents

General

The Flash program is a tool for upgrading the telephone software. This program supports the ***Ericsson Handheld Telephone EH238***.

This description of the Software Upgrading Program includes information of hardware requirements, installation, set-up and running instructions.

Note

Read through this instruction carefully even if you are familiar with earlier versions of the Flash programs for the Ericsson telephones.

Hardware Requirements

To use the Flash program for the ***Ericsson Handheld Telephone EH238*** you need the following:

- **PC**
  An IBM 386, IBM 486, or a 100% IBM compatible PC with DOS version 3.3 or higher is needed.
- **COM port**
  One free COM port, either COM1 or COM2 of your PC, is needed.
- **Programming interface**
  The special programming interface, NTZ 112 243, is needed.
- **Programming cable**
  The special programming cable, KRY 101 1135/8, is needed.
- **Adapter**
  If your computer is equipped with a 9-pin COM connector, you also need a 9- to 25-pin adapter to connect the programming interface.
  (This adapter is **not** supplied)

Note

The Software Upgrading Program can not be run from a server in a LAN (Local Area Network).

Installation of Software Upgrading Program

Install the Software Upgrading Program by following these instructions.

1 Install the software on the hard disk. Copy the contents of the diskette to a directory on the hard disk by typing the following commands at the DOS-prompt (Note that **(RETURN)** means that you should press the return key on the PC keyboard):

MD MYDIR (RETURN)
CD MYDIR (RETURN)
COPY A:*.* (RETURN)

2 Execute the self-extracting file by typing the name of the .EXE-file that is shown on the monitor.

PFL _ _ _ _ _ .EXE (RETURN)

3 Delete the self-extracting file by typing DEL followed by the name of the .EXE-file that is shown on the monitor.

DEL PFL _ _ _ _ _ .EXE (RETURN)]

4 The installation of the Software Upgrading Program is completed.

Note
For further information about how to operate in DOS, see your DOS manual.

Set-up

To make the set-up for the upgrading of the Ericsson Handheld Phone EH238, follow the instructions below. See *Figure 1*.

1 Connect the programming interface, NTZ 112 243 to the free COM port.

2 Connect the programming cable, KRY 101 1135/8 to the interface.

3 Connect the phone to the programming cable.

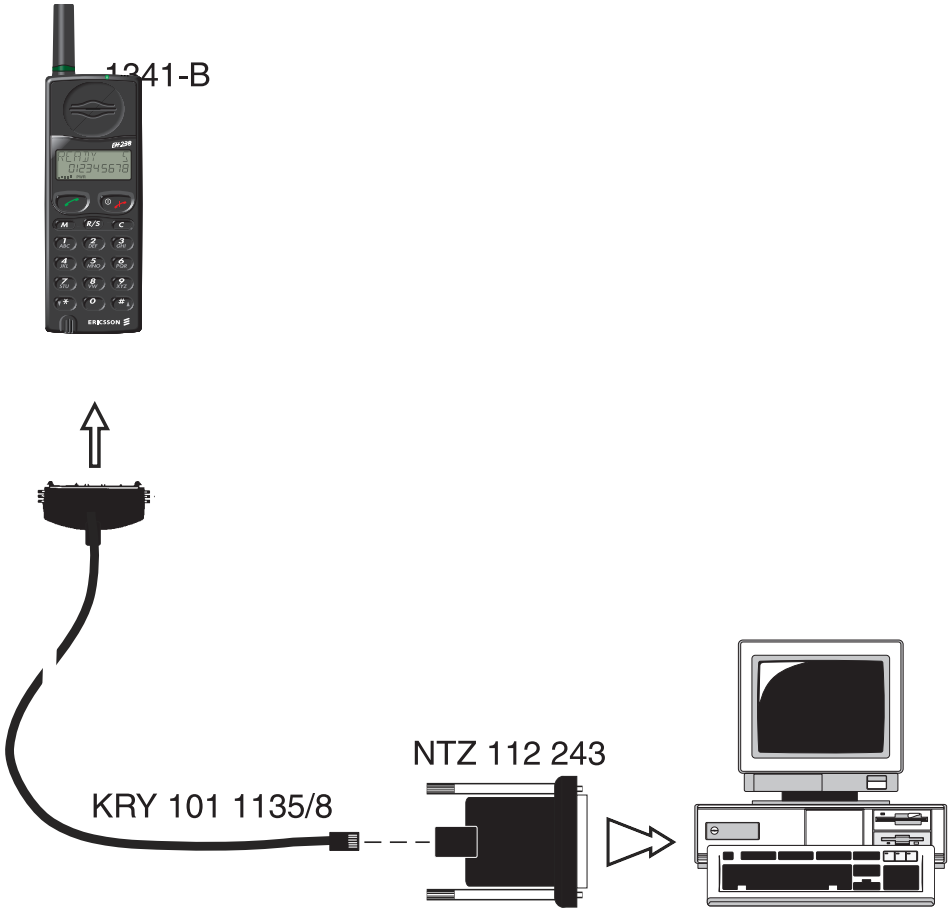


Figure 1. Set-up for upgrading the software

Note
Keep the phone turned **OFF** until the program instructs you to turn it ON.

Use a **fully charged** battery. Since the interface is powered by the phone, the use of an even slightly discharged battery may give unpredictable results.

Running Instructions

When the program is installed and the set-up is performed, you can run the Software Upgrading Program in DOS only.

***FLXXY_ZZ*.EXE** mentioned below is a software code name describing the file as follows:

- *FL* Flash software
- *XX* Two-digit number stating the telephone family (EH238 = *07*)
- *Y* Shell revision (0 - 9)
- *ZZ* Flash software revision (1A - 9Z)

The ***FLXXY_ZZ*.EXE** file is the shell that is used for loading the FLH files into the phone. The following program switches can be attached when starting the program:

- /C 1 will start the program configurated for COM port #1
- /C 2 will start the program configurated for COM port #2
- /M will set the display colours to monochrome mode.
- /? will display information about all these program switches.

Example: Start the program without using the supplied .BAT files configurated for COM 1 by typing:

FL07*Y_ZZ* / C 1 (RETURN)

If you need help with these switches, type HELP at the DOS prompt in the directory containing the **HELP.BAT** and **FL07*Y_ZZ* .EXE** files.

Note: When typing the above string, replace the ***Y*** and ***ZZ*** with the appropriate shell revision (0 - 9) and flash software revision (1A - 9Z) resp.

Run the Software Upgrading Program by typing the number of the COM port you are using. This will start a .BAT file that will configurate your Software Upgrading Program properly.

1 If you are using COM1, type:
1 (RETURN)

If you are using COM2, type:

2 (RETURN)

Read the information in the *Information* window presented on your monitor. You will get information about what types of telephones that are supported by this program. When ready, press any key to continue.

2 Switch the phone ON by pressing the ON/OFF key just shortly and within one second, press the Enter key of the PC. The purpose of this operation is to start the phone and the Software Upgrading Program simultaneously.

3 The program will inform you when the upgrading is completed.

4 Turn the phone OFF and disconnect it from the programming cable.

5 Turn the phone ON and make a test call.

6 Press **ESC** once to go back to the program start.
(You can now connect another phone to the programming cable and start the Software Upgrading Program again. Go to step 2.)

Press **ESC** again if you want to exit the Software Upgrading Program.