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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

WRITER'S DIRECT NO.

(202) 828-0155

September 6, 2001

Ms. Magalie R. Salas
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Oral Ex Parte Presentation
CC Docket No. 94-102

Dear Ms. Salas:

On behalf of my client QUALCOMM Incorporated ("QUALCOMM"), this is to report that on September 5, 2001, Jonas Neihardt, Vice President of Federal Affairs for QUALCOMM and I met with Commissioner Kevin J. Martin and Monica Desai, Legal Advisor to Commissioner Martin to discuss matters related to the above-referenced proceeding.

I. Summary

During this meeting, we discussed two principal topics with Commissioner Martin and Ms. Desai. First, we provided them with information about the substantial progress of QUALCOMM and its handset vendor partners in producing phones containing QUALCOMM chips and software incorporating QUALCOMM's gpsOne position location technology (wireless assisted GPS), which meets the Commission's accuracy rules and will be ready for deployment by the Commission's October 1, 2001 deadline. It is now clear that a number of wireless carriers, including Sprint PCS, Verizon Wireless, Alltel, Qwest, and Leap Wireless, will be deploying this highly accurate position location technology consistent with the Commission's rules as they provide both 2G and 3G services, and the subscribers of these carriers' services will enjoy a large measure of added safety and protection from highly accurate E911 service.

Second, we also discussed QUALCOMM's opposition to the waiver requests filed by AT&T Wireless and Cingular seeking permission for delayed deployment of technologies (E-OTD and, in the case of AT&T Wireless, MNLS) which do not now meet the Commission's accuracy rules, will not do in the near future if ever, and will not be ready for deployment by the October 1, 2001 deadline, and QUALCOMM's opposition to any blanket rollback of the October 1, 2001 deadline or blanket rollback or elimination of any of the other deadlines in the

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Commission's E911 rules (so-called "uniform relief"). We argued that a grant of the AT&T and Cingular waiver requests would allow AT&T and Cingular to avoid providing highly accurate enhanced 911 service with the levels of accuracy which the police and other public safety officers need to safeguard the public and which other compliant wireless technologies, produced both by QUALCOMM and its competitors, can deliver. We also argued that the Commission should also deny these requests because any other action would create two very different sets of accuracy rules for wireless carriers: CDMA carriers would still have to meet the existing accuracy rules, but GSM and TDMA carriers would be permitted to meet very relaxed standards which they selected for themselves through their waiver requests. To protect the public, the Commission should deny these waiver requests and insist that they come forward with plans to deploy technologies which meet the Commission's accuracy rules.

II. QUALCOMM's Substantial Progress in Producing Chipsets and Software to Enable Wireless Carriers to Deploy Wireless Assisted GPS to Meet the Commission's Accuracy Requirements and the Commission's Deadlines

To demonstrate that QUALCOMM and its handset vendor partners are on track in producing 2G wireless phones containing QUALCOMM's MSM3300 chipsets, the first chipset which allows handset manufacturers to make 2G wireless phones incorporating QUALCOMM's gpsOne position location technology (wireless assisted GPS) to meet the FCC's E9-1-1 mandate, we showed Commissioner Martin and Ms. Desai an actual Denso 3300 Form Factor Appropriate ("FFA") wireless phone containing a MSM3300 chipset, and we provided them with the attached page showing the Denso 3300 phone and describing the worldwide deployments of gpsOne. We explained that these Denso phones, along with 2G wireless phones manufactured by other handset vendors, will be available to wireless operators by October 1, 2001, with additional models containing the MSM3300 available shortly thereafter.

As a further demonstration that QUALCOMM is on schedule in the production of chipsets incorporating QUALCOMM's gpsOne technology, we showed Commissioner Martin and Ms. Desai a wireless device incorporating the MSM3300 which was deployed beginning in Japan in April 2001 by a private Japanese security company, SECOM, using KDDI's cellular network. We also gave them the attached page on this first gpsOne commercial deployment, which has a picture of this device marketed by SECOM. The very successful initial results of this commercial results are more fully described in my ex parte letter dated April 25, 2001.

In addition, we provided Commissioner Martin and Ms. Desai a copy of the attached press release, dated April 16, 2001, in which QUALCOMM announced that it had begun shipping samples of its MSM5100 chipset, which includes both QUALCOMM's gpsOne technology to meet the FCC's E911 mandate and QUALCOMM's 3G cdma2000 1x technology, which supports data rates of up to 307 kbps to enable the provision of 3G services. Based upon QUALCOMM's current schedule in the production and shipment of MSM5100 chipsets and QUALCOMM's understanding of the current progress of handset manufacturers, QUALCOMM anticipates that there should be 5100-powered handsets, with both E911 and 3G 1x capabilities, commercially available before the end of 2001. Thus, without any additional spectrum, wireless carriers who have opted to deploy cdma2000 1x and gpsOne will be able to deliver both 3G high

speed data services and the added protection afforded by enhanced 911 service consistent with the Commission's accuracy rules beginning in late 2001.

In sum, we stated that QUALCOMM has followed through on its commitment to giving wireless carriers the tools they need to provide E911 service with the mandated accuracy levels to protect the public and to enable the carriers to meet the deadlines in the Commission's rules. We also gave Commissioner Martin and Ms. Desai the attached page which shows that the wireless assisted GPS technology has been tested worldwide on the AMPS, CDMA, GSM, and PDC (similar to TDMA) air interfaces and has exceeded the Commission's accuracy rules in all of these tests.

III. The Commission Should Deny the Requests of AT&T and Cingular for Waivers of the Rules to Deploy Technologies Which Do Not Meet the Commission's Accuracy Rules and Will Not Give the Public the Protection from Enhanced 911 Service Guaranteed By the Commission's Rules

We told Commissioner Martin and Ms. Desai that the Commission should deny the AT&T and Cingular waiver requests because the technologies they propose to deploy are not reliable and will not produce accuracy which meets the Commission's accuracy rules, which are the heart of the Commission's E911 program. In addition, we provided Commissioner Martin and Ms. Desai with the attached materials, including my ex parte letter of August 13, 2001 containing detailed information about the deficiencies of E-OTD and MNLS technology and about the availability of reasonable alternatives to the grant of a waiver for AT&T or Cingular to deploy E-OTD or MNLS.

We provided Commissioner Martin and Ms. Desai with a copy of the documents attached hereto.

Sincerely yours,



Dean R. Brenner
Attorney for QUALCOMM Incorporated

Cc: Commissioner Kevin J. Martin
Monica Desai, Esq.

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OFFICE OF THE SECRETARY

August 13, 2001

Ms. Magalie R. Salas
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Oral Ex Parte Presentation
CC Docket No. 94-102

Dear Ms. Salas:

On behalf of my client QUALCOMM Incorporated ("QUALCOMM"), this is to report that on August 10, 2001, Jonas Neihardt, Vice President, Federal Affairs of QUALCOMM, and I met with Kris Monteith, Tom Navin, Patrick Forster, and Marty Liebman of the Wireless Telecommunications Bureau (collectively referred to as the "WTB Staff") to discuss matters related to the above-referenced proceeding.

I. Summary

At the meeting, we discussed two principal topics. First, we provided the WTB Staff with information about the substantial progress of QUALCOMM and its handset vendor partners in producing phones containing QUALCOMM chips and software incorporating QUALCOMM's gpsOne position location technology (wireless assisted GPS), which meets the Commission's accuracy rules and will be ready for deployment by the Commission's October 1, 2001 deadline. It is now clear that a number of wireless carriers, including Sprint PCS, Verizon Wireless, Alltel, Qwest, and Leap Wireless, will be deploying the highly accurate gpsOne position location technology consistent with the Commission's rules as they provide both 2G and 3G services, and the subscribers of these carriers' services will enjoy a large measure of added safety and protection from highly accurate E911 service.

Second, we also discussed QUALCOMM's opposition to the waiver requests filed by AT&T Wireless and Cingular seeking permission for delayed deployment of technologies (E-OTD and, in the case of AT&T Wireless, MNLS) which do not now meet the Commission's accuracy rules, will not do in the near future if ever, and will not be ready for deployment by the October 1, 2001 deadline. We argued that a grant of these waiver requests would allow AT&T

Wireless and Cingular to avoid providing highly accurate enhanced 911 service with the levels of accuracy which the police and other public safety officers need to safeguard the public and which other compliant wireless technologies, produced both by QUALCOMM and its competitors, can deliver. To protect the public, the Commission should deny these waiver requests.

We also said that the Commission should also deny these requests because any other action would create two very different sets of accuracy rules for wireless carriers: CDMA carriers would still have to meet the existing accuracy rules, but GSM and TDMA carriers would be permitted to meet very relaxed standards which they selected for themselves through their waiver requests. We told the WTB Staff that such a result would be fundamentally unfair and would distort the competitive marketplace for wireless services. To protect the public and to ensure a level playing field in the wireless marketplace, we stated that the Commission should insist that all carriers adhere to the same set of accuracy rules, the rules which are supposed to give the nation's public safety community the highly accurate enhanced 911 service they need to protect the public's safety.

Major nationwide wireless carriers such as AT&T and Cingular are certainly not at any disadvantage in deploying compliant E911 technology just because they use the TDMA and GSM air interfaces. In the meeting with the WTB Staff, we reminded them that, as QUALCOMM has noted in prior filings in the E911 proceeding, QUALCOMM has licensed its technology to Texas Instruments and Motorola, companies which produce chips for GSM and TDMA phones. We also provided the WTB Staff with information in the attached documents showing that QUALCOMM's Snap Track subsidiary has successfully demonstrated in Europe that its wireless assisted GPS technology works well for GSM carriers and that NEC is in the process of producing chipsets for the PDC air interface, an interface used by Japanese carriers which is similar to TDMA. We explained that QUALCOMM's wireless assisted GPS technology is not dependent on a particular air interface or type of wireless network. Moreover, we provided the WTB Staff with a copy of a recent announcement by Cellpoint and SiRF announcing a partnership to deliver a platform of GSM phones with assisted GPS technology for U.S. wireless operators with GSM systems.

The only fair conclusion from this base of information is that if either AT&T or Cingular had asked handset vendors to deliver wireless phones with compliant assisted GPS technology, they could do so, but for their own reasons, AT&T and Cingular have decided not to do so. As a result, during the meeting, we urged the Commission to conclude that there are reasonable alternatives to a waiver, and on this basis as well, the Commission should deny waivers to AT&T and Cingular.

In addition, we pointed out to the WTB Staff the substantial deficiencies in both the E-OTD and MNLS technologies. The AT&T and Cingular waiver requests do not represent "paths to compliance" because there has been no proof that these technologies can ever meet the Commission's accuracy rules.

QUALCOMM has previously described the inadequacies of E-OTD in its prior filings to which we referred in the meeting, including its September 29, 2000 filing which attached a Technical Report of Omnipoint Technologies finding that E-OTD is not robust, will not produce the level of accuracy promised by its proponents, and is inferior to uplink TOA, a location technology offered by a variety of vendors. We also referred to a letter dated September 1, 2000 summarizing QUALCOMM's ex parte presentations on August 31, 2000 concerning the availability of compliant alternatives for GSM carriers and the lack of sufficient testing of E-OTD.

With regard to MNLS, we pointed out that recent filings by TruePosition and SigmaOne Communications dated July 23 and 24, 2001 have established that the MNLS technology will not work to produce the necessary levels of accuracy and has not been sufficiently tested. AT&T appears to acknowledge the insufficiency of the testing of MNLS in its letter of August 6, 2001 to the Chief of the Wireless Telecommunications Bureau, in which AT&T announces that in early September, less than one month before the deadline for the deployment of E911 service, AT&T "hopes" to begin drive testing of MNLS in Orlando, Florida.

Moreover, we noted that on August 8, 2001, US Wireless filed a Technical Report with the results of testing of MNLS in two highly limited and selected geographic areas comprising a total of 22.5 square miles, testing which was conducted after two models were developed using data from these small regions. One of the two models was a sophisticated CRC model developed for the specific regions tested, and it was this model which US Wireless used to validate the test results to support the claim that the technology could be used in the balance of AT&T's network. In our meeting with the WTB Staff, we pointed out that even under these cherry picked, ideal conditions (areas which have an unduly large number of cell sites), this testing actually provides no support for any claim that MNLS is a reliable location method or that it will ever come close to the Commission's accuracy rules. US Wireless picked two well surveyed, confined, and small areas, built models and algorithms for those areas, and then conducted tests in the same areas; and, to get test results close to the woefully inadequate levels of accuracy promised by AT&T, they had to take repeated measurements (3 to 6 times) at each location. In fact, all test data and calibration data were taken from the dashboard of a van traveling down streets and highways; the test provides no insight about how MNLS would perform for users on a sidewalk, in a shop, or anywhere other than in a van in the middle of the road. We told the WTB Staff that this testing says nothing about whether the models or the MNLS technology would work in any other area, much less any area where repeated calibration measurements have not been taken to build a database, where the cell sites are more typically spaced, or where signal strength is not predictable for a host of reasons.

Indeed, we noted that the US Wireless testing purposely excluded rural areas or indoor settings, where it is apparent that MNLS will not work to any reliable or substantial extent. US Wireless does not even attempt to explain the level of accuracy by which MNLS will yield positioning indoors, where the required signal strength may not be achieved. Likewise, even in AT&T's Orlando testing, they apparently will not try to test MNLS in a rural area. Residents of

rural areas especially need E911 service because they tend to live greater distances from hospitals and emergency facilities, and the use of MNLS will not enable AT&T to provide accurate E911 service in such areas. We stated that MNLS technology will not work satisfactorily in rural areas, indoors, or in any other area in which AT&T has not performed extensive calibration measurements repeatedly and within a recent time frame from the date of any particular 911 call since US Wireless itself has written that, in its experience, drive testing is required approximately twice per year in the affected regions to maintain performance levels. In short, MNLS technology will not provide reliable or accurate E911 service throughout the country.

For all of these reasons, in our meeting with the WTB Staff, we urged the Commission to deny the AT&T and Cingular waiver requests. We explained that previously, Snap Track and other companies asked the Commission for more time to deliver a solution with substantially greater accuracy. By contrast, now, AT&T and Cingular are now each asking for more time to deploy technologies with substantially worse accuracy. AT&T and Cingular's requests are not in the public interest and should therefore be denied.

II. QUALCOMM's Substantial Progress in Producing Chipsets and Software to Enable Wireless Carriers to Deploy Wireless Assisted GPS to Meet the Commission's Accuracy Requirements and the Commission's Deadlines

To demonstrate that QUALCOMM and its handset vendor partners are on track in producing 2G wireless phones containing QUALCOMM's MSM3300 chipsets, the first chipset which allows handset manufacturers to make 2G wireless phones incorporating QUALCOMM's gpsOne position location technology (wireless assisted GPS) to meet the FCC's E9-1-1 mandate, we showed the WTB Staff an actual Denso 3300 Form Factor Appropriate ("FFA") wireless phone containing a MSM3300 chipset, and we provided the WTB Staff with the attached page showing the Denso 3300 phone and describing the worldwide deployments of gpsOne. We explained to the WTB Staff that these Denso phones, along with 2G wireless phones manufactured by other handset vendors, will be available to wireless operators by October 1, 2001, with additional models containing the MSM3300 available shortly thereafter.

As a further demonstration that QUALCOMM is on schedule in the production of chipsets incorporating QUALCOMM's gpsOne technology, we showed the WTB Staff a wireless device incorporating the MSM3300 which was deployed beginning in Japan in April 2001 by a private Japanese security company, SECOM, using KDDI's cellular network. We gave the WTB Staff the attached page on this first gpsOne commercial deployment, which has a picture of this device marketed by SECOM. We stated that this deployment has been very successful both commercially and in enhancing public safety, and the initial commercial results are more fully described in my ex parte letter dated April 25, 2001. Since April 2001, through these devices, thousands of Japanese citizens and their families have enjoyed the added safety afforded by wireless assisted GPS at accuracy levels meeting or exceeding the Commission's accuracy rules for handset solutions.

In addition, we discussed with the WTB Staff QUALCOMM's current progress in producing chipsets containing both QUALCOMM's gpsOne position location technology and QUALCOMM's 3G cdma2000 1x technology. We provided the WTB Staff with a copy of the attached press release, dated April 16, 2001, in which QUALCOMM announced that it had begun shipping samples of its MSM5100 chipset, which includes both QUALCOMM's gpsOne technology to meet the FCC's E911 mandate and QUALCOMM's 3G cdma2000 1x technology, which supports data rates of up to 307 kbps to enable the provision of 3G services.

Based upon QUALCOMM's current schedule in the production and shipment of MSM5100 chipsets and QUALCOMM's understanding of the current progress of handset manufacturers, we stated that QUALCOMM anticipates that there should be 5100-powered handsets, with both E911 and 3G 1x capabilities, commercially available before the end of 2001. Thus, without any additional spectrum, wireless carriers who have opted to deploy cdma2000 1x and gpsOne will be able to deliver both 3G high speed data services and the added protection afforded by enhanced 911 service consistent with the Commission's accuracy rules beginning in late 2001.

QUALCOMM has been sensitive to the needs of wireless carriers, particularly the smaller carriers, for technical assistance in deploying gpsOne. In their filings with the Commission, numerous carriers stated that they were interested in a "turnkey" solution for E911 service. To this end, we provided the WTB Staff with the attached press released dated August 6, 2001 in which Snap Track, a wholly-owned subsidiary of QUALCOMM, announced an agreement with TechnoCom Corporation ("TechnoCom"), the premier wireless location system deployment and integration experts in the country, which establishes TechnoCom as the preferred field-test, engineering, and integration contractor for carriers and OEMs for the implementation of gpsOne-based wireless location systems in the United States. TechnoCom will guide carriers through their gpsOne deployment and provide ongoing service assurance to maximize the performance of their gpsOne systems in a cost-effective manner. Thus, we explained that QUALCOMM was responding to the needs of wireless carriers as they seek to initiate Phase II service.

In sum, we stated that QUALCOMM has followed through on its commitment to giving wireless carriers the tools they need to provide E911 service with the mandated accuracy levels to protect the public and to enable the carriers to meet the deadlines in the Commission's rules. We gave the WTB Staff the attached page which shows that the wireless assisted GPS technology has been tested worldwide on the AMPS, CDMA, GSM, and PDC (similar to TDMA) air interfaces and has exceeded the Commission's accuracy rules in all of these tests.

III. The Commission Should Deny the Requests of AT&T and Cingular for Waivers of the Rules to Deploy Technologies Which Do Not Meet the Commission's Accuracy Rules and Will Not Give the Public the Protection from Enhanced 911 Service Guaranteed By the Commission's Rules

We explained in our meeting that there are reasonable alternatives to a grant of a waiver to AT&T and Cingular, and that the technology for which they seek a waiver to deploy over an extended timetable falls far short of the accuracy rules and is not likely in the near future if ever to become compliant.

A. There Are Reasonable Alternatives to a Waiver

We told the WTB Staff that QUALCOMM's filings of September 29, 2000 and September 1, 2000 set forth a number of reasonable alternatives to grant of a waiver to GSM carriers to implement E-OTD, and these same alternatives precluded grant of a waiver to either Cingular or AT&T to implement E-OTD. We updated our prior filings with the following information which shows that there are reasonable alternatives to grant of a waiver to Cingular or AT&T to deploy E-OTD over GSM systems and to AT&T to deploy MNLS over TDMA systems.

First, with regard to GSM systems, we provided a copy of the attached press release dated November 28, 2000 announcing the completion of an extensive set of independently audited tests by the Snap Track GSM Test Group of wireless assisted GPS over GSM systems in Europe. This testing was conducted over GSM systems in Paris, Bonn, London, Utrecht, and other European locations, included testing of cross-border roaming, and achieved accuracies which exceeded the FCC's accuracy requirements. Infrastructure providers CMG Telecommunications, Nortel Networks, and Siemens Information and Communications Networks also participated in these tests. These tests proved that wireless assisted GPS technology is technically feasible for AT&T, Cingular, and other GSM carriers. We told the WTB Staff that if these carriers pursued this technology with handset vendors, there was no reason why it could not be deployed commercially.

Second, we provided the WTB Staff with the attached press release dated August 7, 2001 announcing that CellPoint and SiRF had formed a strategic partnership to integrate wireless assisted GPS technology with network technology for GSM carriers in the United States.

Third, with regard to TDMA, we gave the WTB Staff a copy of a press release dated January 31, 2001 announcing that NEC Corporation and Snap Track had developed a chipset incorporating wireless assisted GPS for wireless phones using the PDC air interface. Wireless phones containing these chipsets will be deployed in Japan. We explained to the WTB Staff that the PDC air interface is similar to TDMA.

Based upon all of this information, we reiterated QUALCOMM's position that AT&T

and Cingular have not met, and cannot meet, their burden of showing the absence of reasonable alternatives to the grant of their waiver requests, and as a result, the Commission should deny the waiver requests.

B. E-OTD and MNLS Technology Does Not Meet the FCC's Accuracy Rules, Will Not Meet Those Rules in the Near Future If Ever, and Is Not Reliable

We told the WTB Staff that QUALCOMM's filings of September 29, 2000 and September 1, 2000 already established that E-OTD was not compliant, was not likely to become compliant because of its inherent flaws, and is not a reliable location technology. In this regard, we referred the WTB Staff to the July 2, 1999 Technical Report of Omnipoint Technologies, Inc., which is attached to QUALCOMM's September 29, 2000 filing. The Report, which was prepared to compare location technologies under consideration by the GSM community, found that E-OTD technology is not robust, has extensive problems which will be difficult to solve, will not produce the accuracy promised by its proponents, and is inferior to uplink TOA, a technology which was the first location solution standardized for GSM carriers. Uplink TOA is a network technology which, in contrast to E-OTD, does not require any changes to handsets. We reiterated that the Commission should not grant a waiver to Cingular, AT&T, or any other carrier to deploy E-OTD in light of its deficiencies.

We also discussed with the WTB Staff the inherent deficiencies in the MNLS technology for which AT&T seeks a waiver to deploy over its TDMA network. We asked the WTB Staff to consider the real world impact of granting a waiver for this technology as the police rely on enhanced 911 service to protect the public. When MNLS is initially deployed, even AT&T claims merely that it will produce accuracy of 750 meters 95% of the time, according to AT&T's letter filing of August 6, 2001. That level of accuracy will not protect the public adequately according to the public safety community. To demonstrate this flaw in vivid terms, we provided Ms. Monteith with the attached maps comparing 50 meter, 100 meter, and 750 meter accuracies. The maps show beyond doubt that giving 911 operators locations of wireless callers within 750 meters will leave the police and other public safety organizations without sufficient information to locate the wireless callers quickly in emergencies.

We also discussed the flaws in MNLS set forth in the filings of TruePosition and SigmaOne Communications dated July 23 and 24, 2001. For example, we noted that TruePosition found a 6 dB standard deviation in the forward channel relative power measurements made by TDMA mobile phones, the measurements on which MNLS relies, as measured in 10 meter by 10 meter test areas. TruePosition showed that this deviation increases substantially as the distance of a TDMA mobile from a cell site expands, thereby increasing location error. We pointed out that TruePosition ran a simulation study using cell site data from real deployments over many coverage areas, including suburban and rural environments, and found that the expected accuracy for 67% of the calls using MNLS would be no better than the following, without taking into account any of the other flaws in MNLS:

<u>Cell Site Spacing</u>	<u>Accuracy</u>
2 km	340 meters
5 km	850 meters
10 km	1,700 meters
15 km	2,550 meters

These accuracy levels fall far short of the Commission's requirements.

We also said that there has not been sufficient testing of MNLS, and the recent test results submitted by US Wireless actually support our conclusion. The recent US Wireless filing gives the results in two highly limited and selected geographic areas of a total of 23.5 square miles after two models were developed using data from these regions. One of the two models was a sophisticated CRC model developed for the specific regions tested, and it was this model which US Wireless used to validate the test results to support the claim that the technology could be used in the balance of AT&T's network. In our meeting with the WTB Staff, we pointed out that even under these cherry picked, ideal conditions (areas which have an unduly large number of cell sites), this testing actually provides no support for any claim that MNLS is a reliable location method or that it will ever come close to the Commission's accuracy rules. US Wireless picked two well surveyed, confined, and small areas, built models and algorithms for those areas, and then conducted tests in the same areas; and, to get test results close to the woefully inadequate levels of accuracy promised by AT&T, they had to take repeated measurements (3 to 6 times) at each location. This testing says nothing about whether the models or the MNLS technology would work in any other area, much less any area where repeated calibration measurements have not been taken, where the cell sites are more typically spaced, or where signal strength is not predictable for a host of reasons.

In fact, we stated that the test results raise more questions than they answer. The San Ramon testing exhibited worse 67% accuracy than the Oakland testing, but better 95% accuracy. We stated that there was no explanation for this discrepancy. (The US Wireless report states that only partial results for San Ramon were presented, which does not explain the discrepancy.) In addition, we noted that the US Wireless filing does not explain how long it took US Wireless to calibrate the two test regions, and thus their report does not give the Commission any guidance as to how long it will take for AT&T to drive vehicles throughout AT&T's nationwide network to perform 4 or more calibration measurements for each calibration point within 50 by 50 meter grids, although US Wireless does note that increasing the calibration grids to 100 by 100 meters degraded performance. We pointed out that US Wireless' prior filing stated that in US Wireless' experience, drive testing is required approximately twice per year in the affected regions to maintain performance levels.

Indeed, we noted that the US Wireless testing purposely excluded rural areas or indoor settings, where it is apparent that MNLS will not work to any reliable or substantial extent. US Wireless does not even attempt to explain the level of accuracy by which MNLS will yield positioning indoors, where the required signal strength may not be achieved. Likewise, even in AT&T's Orlando testing, they apparently will not try to test MNLS in a rural area. Residents of rural areas especially need E911 service because they tend to live greater distances from hospitals and emergency facilities, and yet MNLS will not enable AT&T to provide accurate E911 service in rural areas. In short, MNLS technology will not produce reliable or accurate E911 service throughout the country. For all of these reasons, we urged the Commission to deny AT&T's waiver request.

IV. Conclusion

We ended the meeting with a brief discussion of the concerns raised by various CDMA carriers concerning actions needed by LECs to enable PSAPs to receive and use Phase II E911 location information. We understand that PSAPs can receive ALI information through "in band" or "out of band" procedures. PSAPs apparently do not need any upgrade from the LEC to receive the information out of band (i.e., by dipping into the ALI database when receiving a wireless 911 call), but LECs are apparently attempting to persuade PSAPs to receive the information in band, which entails use of an ISDN line and an upgrade of the selective router. We noted that there is nothing inherent in wireless assisted GPS technology which requires such an upgrade, and we asked the Commission to assist any PSAP or wireless carrier experiencing any delay in the initiation of Phase II service due to non-action by a LEC.

Sincerely yours,



Dean R. Brenner
Attorney for QUALCOMM Incorporated

cc: Kris Monteith
Tom Navin
Patrick Forster
Marty Liebman

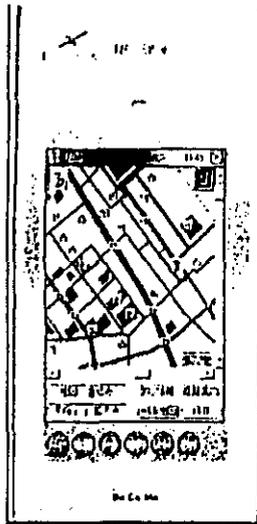
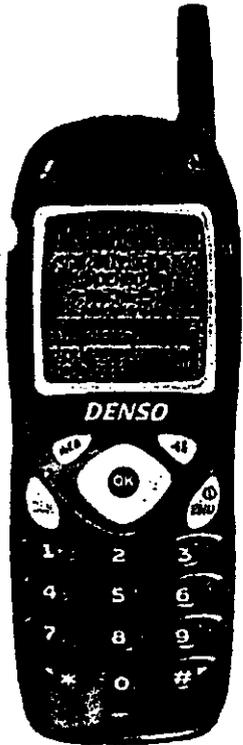
gpsOne and SnapTrack Worldwide

May 2001



Deployment

- Over 30 carriers on three continents have trialed SnapTrack/gpsOne technology in the past 3 years on all major air interfaces
- January 2000 deployment of SnapTrack-enhanced Naviewn in Japan by NTT DoCoMo
- 2001 gpsOne MSM-3300-based deployment in Japan by SECOM on the KDDI network
- 2H2001 deployment of SnapTrack-enhanced 2-way pagers (ReFLEX) in North America via Locate Networks/Glenayre and partners
- 2H2001 gpsOne and MSM-3300 deployment in US by major US CDMA carriers (Sprint PCS, etc.)
- Over 20 CDMA handset manufacturers developing gpsOne-enabled handsets for both Asian and US markets
- Solutions for multiple air interfaces available beginning 2002



Loc8.net

First gpsOne Commercial Product

SECOM.

ポケットの中に、セコム。

「あの子、どこ行っちゃったのかしら」「おばあちゃん、帰り遅いわね…」「あれ？駐車場のクルマがない…」 あつてはならない、万が一の事態に備えること。そんなセキュリティの概念を、今、セコムはさらに進化させます。受信性能を格段に向上させた最先端のGPS技術と、携帯電話ネットワークを活用する測位システムを融合。24時間365日、小型専用端末を所持した利用者または車両の位置情報をかつてない高精度で提供するだけでなく、要請に応じ全国約900カ所の緊急発進基地から、セコムが誇る緊急対応員が出勤します。セコムが誇る緊急対応員が出勤します。クルマ・バイク用で900円からと、低価格を実現。それは、あなたの大切なひとを、クルマを、バイクを見守る。携帯するセキュリティ。セコムから、「位置情報提供・急行サービス」誕生。詳しくは、フリーダイヤルまたはホームページで。

さがす、みつける、かけつける。

ココセコム

4月1日(日)全国一斉サービス開始。 0120-855756 www.855756.com

www.855756.com

We are SECOM.

- SECOM/Hitachi security device on a KDDI CDMA commercial network in Japan
- First deployed April 1, 2001
- Monthly fee: \$5/month, including 2 locate fixes
- Applications in Japan include monitoring location of automobiles, motorcycles, children, seniors





NEWS RELEASE

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QUALCOMM CDMA Technologies Announces On-Time Sample Shipment of World's First 3G 1x Solution with Advanced Position Location Capabilities and Support for Data Rates of up to 307 Kbps

- MSM5100 Integrated Circuit, System Software and SURF Development Platform Supports 3G CDMA2000 1x with Key Wireless Internet Launchpad Features -

SAN DIEGO -- April 16, 2001 -- QUALCOMM Incorporated (Nasdaq: QCOM), pioneer and world leader of Code Division Multiple Access (CDMA) digital wireless technology, today announced the on-time sample shipment of the MSM5100™ Mobile Station Modem (MSM™) Integrated circuit, including the initial release of the QUALCOMM CDMA Technologies (QCT) Dual-Mode Subscriber Software (DMSS™) technology and Subscriber Unit Reference (SURF™) development platform. The MSM5100 integrated circuit and system software, along with key components of QCT's Wireless Internet Launchpad™ suite of advanced technologies, provide handset manufacturers and third-generation (3G) 1x system operators with the ability to deliver the highest level of integration for 3G handsets and quickly roll out new 3G services to their subscribers.

"The MSM5100 integrated circuit and system software, together with the accompanying SURF development platform, delivers our second generation of 3G multimedia solutions, complementing the MSM5105 device that sampled in January 2001," said Don Schrock, president of QUALCOMM CDMA Technologies. "The MSM5100 solution will enable manufacturers to roll out cost-effective 1x handsets and offers the key technologies of QCT's Wireless Internet Launchpad portfolio, including exciting new services such as streaming video and wireless video conferencing, as well as support for E9-1-1 and high-accuracy position location capabilities."

The MSM5100 integrated circuit and system software solution supports data rates of up to 307 kilobits per second (kbps) in the forward link. Capable of providing up to a 50 percent increase in standby times, and up to twice the overall capacity for voice of IS-95A/B systems, the MSM5100 solution will allow manufacturers to develop state-of-the-art 3G handsets that feature the most complete set of positioning, multimedia and other advanced features available in the wireless industry.

The MSM5100 solution incorporates QCT's Wireless Internet Launchpad suite, enabling a broad range of new terminal products, applications and Internet services, including gpsOne™ position location solution and Bluetooth™, as well as multimedia features such as Qtunes™ Moving Picture Experts Group (MPEG-1) Layer-3 (MP3) player software and Compact Media Extension (CMX™) Musical Instrument Digital Interface (MIDI)-based multimedia software. The MSM5100

device also supports the Binary Runtime Environment for Wireless™ (BREW™) applications platform.

The gpsOne solution, which integrates SnapTrack™ technology with Global Positioning System (GPS) satellite and network information, provides a high-availability solution that offers industry-leading accuracy and performance. The gpsOne solution provides the world's most available and cost-effective solution for wireless position location technology in a mobile handset for CDMA cellular and Personal Communications Service (PCS) networks, and will meet the Federal Communications Commission (FCC) mandate requiring wireless operators to provide the location of 911 calls (E9-1-1). The MSM5100 solution also enables a broad range of future 3G GPS-related software and services, including navigation information, area-specific weather forecasts, traffic reports and commercial tracking services, as well as a broad range of entertainment applications, including online chat and bulletin boards.

The MSM5100 integrated circuit also provides the most efficient solution to integrate Bluetooth digital baseband processing into a comprehensive 3G CDMA integrated circuit and system software solution. Bluetooth is a short-range radio technology that eliminates the need for wired connections between digital devices, and is becoming an industry standard to ensure that computing and telecommunications equipment can communicate easily. Bluetooth provides a universal bridge to existing data networks, a peripheral interface, and a mechanism to form small, private ad hoc groupings of connected devices away from fixed network infrastructures.

Optional software from QUALCOMM for the MSM5100 solution enables advanced audio features such as Qtunes MP3 player software and CMX MIDI-based multimedia software.

MP3 is a standard audio file format for compressing a sound sequence into about one-twelfth the size of the original file with very little loss in sound quality. These enhancements will allow a wide variety of future wireless music applications, including karaoke phones, MP3 player phones and more.

The MSM5100 solution also integrates a mass storage device controller, such as a Multimedia Card (MMC) interface, which will provide an effective interconnection to much larger memory space to store MP3 music data or mapping data from a geographical navigation service.

The MSM5100 solution is available in a 208-ball Fine-Pitch Ball Grid Array (FBGA) production package, and is pin-compatible with the MSM3300™ IS-95A/B integrated circuit, which will enable handset manufacturers to reduce the time-to-market for highly integrated and feature rich 3G CDMA2000 handsets as 3G networks and services are being rolled out.

QCT, a division of QUALCOMM Incorporated, is a developer and supplier of CDMA integrated circuits, hardware and software solutions, and tools, with more than 133 million cumulative shipments of MSM chips worldwide. QCT offers wireless position location technology by SnapTrack, a wholly owned subsidiary of QUALCOMM. QCT supplies chipsets to the world's leading CDMA handset and infrastructure manufacturers including: Acer Peripherals, Inc., ALPS ELECTRIC CO., LTD.; CASIO COMPUTER CO., LTD.; FUJITSU LIMITED; Hitachi, Ltd.; Hyundai Electronics Industries Co., Ltd.; KYOCERA CORPORATION; LG Information and Communications, Ltd.; Samsung Electronics Ltd.; SANYO Electric Co., Ltd.; and Toshiba Corporation, among others.

QUALCOMM Incorporated (www.qualcomm.com) is a leader in developing and delivering innovative digital wireless communications products and services based on the Company's CDMA digital technology. The Company's business areas include CDMA integrated circuits and system software; technology licensing; the BREW applications platform; Eudora® e-mail software; digital cinema systems; and satellite-based systems including portions of the Globalstar™ system and wireless fleet management systems, OmniTRACS® and OmniExpress™. QUALCOMM owns patents that are essential to all of the CDMA wireless telecommunications standards that have been adopted or proposed for adoption by standards-setting bodies worldwide. QUALCOMM has licensed its essential CDMA patent portfolio to more than 100 telecommunications equipment manufacturers worldwide. Headquartered in San Diego, Calif., QUALCOMM is included in the S&P 500 Index and is a 2000 FORTUNE 500® company traded on The Nasdaq Stock Market® under the ticker symbol QCOM.

Except for the historical information contained herein, this news release contains forward-looking statements that are subject to risks and uncertainties, including the Company's ability to successfully design and have manufactured significant quantities of CDMA components on a timely and profitable basis, the extent and speed to which CDMA is deployed, change in economic conditions of the various markets the Company serves, as well as the other risks detailed from time to time in the Company's SEC reports, including the report on Form 10-K for the year ended September 24, 2000, and most recent Form 10-Q.

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Monday August 6, 7:31 am Eastern Time

Press Release

SOURCE: SnapTrack, Inc.

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SnapTrack and TechnoCom Team Up to Provide gpsOne-Based E9-1-1 and Location-Based Commercial Services Deployment Support to Wireless Carriers

CAMPBELL, Calif.--(BUSINESS WIRE)--Aug. 6, 2001--SnapTrack, Inc.®, a wholly-owned subsidiary of QUALCOMM Incorporated (Nasdaq:QCOM - news), and TechnoCom Corporation®, today announced a joint effort to provide integration and deployment support for E9-1-1 emergency cell phone location and location-based commercial services for QUALCOMM's SnapTrack-enhanced, gpsOne(TM)-based wireless location systems. gpsOne technology provides industry-leading accuracy, availability and performance, and comprises a complete client-server-based wireless location systems solution for carriers worldwide, including integrated chipsets supporting multiple wireless standards and SnapTrack's SnapSmart(TM) Position Determination Entity (PDE) location server software. The agreement between the two companies establishes TechnoCom as the preferred field-test, engineering services, and integration contractor for carriers and SnapTrack OEMs for deployment services, trial management and implementation of gpsOne-based wireless location systems in the United States.

"We're very pleased to be working with TechnoCom, the premier wireless location system deployment and integration experts providing Phase II E9-1-1 implementations throughout the United States," said Bret Sewell, president of SnapTrack. "This greatly advances gpsOne deployment capabilities and provides carriers around the world with experienced gpsOne systems implementation expertise."

"By applying TechnoCom's wireless and location system deployment experience and tools to Qualcomm's commercial Hybrid Wireless Assisted GPS and gpsOne solutions, carriers will have access to best-of-breed

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wireless location technology, software, systems engineering, and integration and deployment services," said Mario Proietti, CEO of TechnoCom. "We'll guide carriers through their gpsOne deployment and provide on-going service assurance to cost-effectively maximize the performance of their gpsOne systems."

• Time zone to time zone never set your watch again

Under the agreement, SnapTrack will provide TechnoCom with training and experience on demonstration and validation utilities for SnapTrack's SnapSmart PDE server software, and TechnoCom will adapt its suite of location system deployment, testing and performance-monitoring applications for use with the SnapTrack SnapSmart system. SnapTrack and TechnoCom will also jointly develop and certify gpsOne field-test methods and procedures that will be used to ensure uniform standards for TechnoCom-managed deployment activities and trials.

Headquartered in Encino, California, TechnoCom Corporation provides systems engineering, services and products that enable location for a rapidly expanding range of global wireless applications. Founded in 1995, TechnoCom develops, integrates and deploys location systems for leading wireless carriers and location service providers to bring solutions for wireless E9-1-1 and location-based commercial services to market. TechnoCom is working with five of the top 10 U.S. carriers to enable their wireless E9-1-1 and location-based services and has developed a suite of tools for the design, deployment and testing of wireless location systems. TechnoCom also develops hardware and software based on its LM Exchange(TM) platform for GPS-based location services that provide solutions for mobile applications such as telematics, fleet management, mobile commerce, public safety and asset tracking. TechnoCom is led by a team that helped pioneer wireless location technology and has deployed and operated location systems around the world. For more information, please visit <http://www.technocom-wireless.com>.

Headquartered in Campbell, California, SnapTrack is focused on integrating GPS and two-way wireless technologies. SnapTrack's patented architecture offers anytime, anywhere, accurate, high-speed location of a wireless caller, even inside buildings where conventional GPS does not operate. SnapTrack pioneered Wireless Assisted GPS(TM) and owns patents that are fundamental to the cost-effective deployment of Wireless Assisted GPS-based location systems. The Company's Wireless Assisted GPS products include the SnapSmart location server software system, the SnapCore(TM) multi-mode GPS solution and the SnapWARN(TM) GPS reference service. SnapTrack has commercial agreements with major wireless chipset vendors that provide most of the wireless modem chipsets to the industry. In addition, many major carriers have chosen to deploy products and services incorporating SnapTrack technology. SnapTrack is a wholly owned subsidiary of QUALCOMM. For more information, please visit <http://www.snaptrack.com>.

QUALCOMM Incorporated (www.qualcomm.com) is a leader in developing and delivering innovative digital wireless communications products and services based on the Company's CDMA digital technology. The Company's business areas include CDMA integrated circuits and system software; technology licensing; the Binary Runtime Environment for Wireless(TM) (BREW(TM)) applications platform; Eudora® e-mail software; digital cinema systems; and satellite-based systems including portions of the Globalstar(TM) system and wireless fleet management systems, OmniTRACS® and OmniExpress(TM). QUALCOMM owns patents that are essential to all of the CDMA wireless telecommunications standards that have been adopted or proposed for adoption by standards-setting bodies worldwide. QUALCOMM has licensed its essential CDMA patent portfolio to more than 100 telecommunications equipment manufacturers worldwide. Headquartered in San Diego, Calif., QUALCOMM is included in the S&P 500 Index and is a 2001 FORTUNE 500® company traded on The Nasdaq Stock Market® under the ticker symbol QCOM.

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and have manufactured significant quantities of CDMA components on a timely and profitable basis, the extent and speed to which gpsOne is deployed, change in economic conditions of the various markets the Company serves, as well as the other risks detailed from time to time in the Company's SEC reports, including the report on Form 10-K for the year ended September 24, 2000, and most recent Form 10-Q.

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Wireless Assisted GPS Proven Worldwide on Major Air Interfaces: AMPS, CDMA or GSM



Denver, CO (analog/CDMA)
outdoor, open: $1-\Sigma = 4$ m



San Francisco, CA (analog/GSM/CDMA)
inside urban parking garage: $1-\Sigma = 45$ m



Tampa, FL (CDMA)
1st story, 2-story house: $1-\Sigma = 20$ m



Tokyo, Japan (PHS/PDC)
dense urban: $1-\Sigma = 18$ m



Madrid, Spain (GSM)
dense urban: $1-\Sigma = 37$ m



Washington, D.C. (analog)
urban alley: $1-\Sigma = 50$ m

*Sample data from specific field tests, may not be representative of all conditions



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SnapTrack GSM Test Group Successfully Completes Most Extensive Pan-European Tests of High-Accuracy Wireless Location Technology

-- Wireless Assisted GPS-Based System Trials Demonstrate SMS, Seamless Cross-Border Roaming --

SAN JOSE, Calif. -- November 28, 2000 -- SnapTrack Inc., a wholly owned subsidiary of QUALCOMM Incorporated (Nasdaq: QCOM) and leader in wireless position location technology, today announced the completion of an extensive series of wireless handset location tests across Europe, marking more than one year of independently audited testing of SnapTrack's Wireless Assisted GPS™ system by Global System for Mobile telecommunications (GSM) industry leaders. The tests, conducted by members of SnapTrack's GSM Test Group, (an international consortium of GSM carriers, handset suppliers, applications providers, infrastructure manufacturers and semiconductor manufacturers), conclusively proved that SnapTrack's technology can accurately and rapidly locate mobile phones in a wide range of European calling environments and support seamless cross-border location roaming services.

Wireless handset location roaming trials, using prototype handsets and two types of miniature GPS antennas suitable for use in small mobile devices, were conducted in and around the major urban centers of Paris, Bonn, London and Utrecht, as well as other locations. A single Location Server hosted by France Telecom Mobiles provided location calculation support for all of the trial locations in Western Europe, and demonstrated SnapTrack's unique ability to provide cross-border roaming and wide-area service coverage from a single service center. Callers were successfully located on successive networks during the trials in a wide range of environments, from city centers, to rural villages and motorways. CMG Telecommunications teamed with France Telecom Mobiles and SnapTrack to provide the interface between the location server and the network Short Message Service Center (SMSC) to test the use of SMS as the data bearer for wireless position information. This approach allows location transactions to take place during voice calls and during idle mode. CMG Telecommunications believes that the Short Message Service turned out to be suitable for this type of application.

For relatively open outdoor sites, including suburban neighborhoods and wooded parks, typical accuracies were in the 5-10 meter range. Outdoor testing in dense urban and urban canyon environments, including both narrow, medieval Parisian streets and modern skyscraper complexes, yielded average accuracies of 30-50 meters, with some results as precise as 10 meters. Indoor tests were conducted in a variety of commercial and residential structures in both city center and suburban locations. Included in these tests were train stations, apartment buildings, office buildings, restaurants, shops and residences. Typical accuracies for these indoor sites ranged from 30 to 45 meters with some yields as precise as 20 meters. The roaming tests in London showed very similar accuracies to the Paris tests, clearly demonstrating the viability of operation across carrier network boundaries.

"We're looking forward to continuing our work with the GSM Test Group to bring the benefits of SnapTrack's wireless location system to the market," said Steve Poizner, president of SnapTrack. "The pan-European roaming trials clearly demonstrate that our technology can achieve high levels of accuracy — even in very harsh calling environments where other location technologies fail to perform. These trials not only demonstrated SnapTrack's compatibility with SMS, but also that SnapTrack's enhanced GPS handset-

based technology represents the most cost-effective, high quality solution for seamless cross-border, cross-network location services roaming."

The SnapTrack GSM Test Group Phase I trials in Madrid, Spain, successfully demonstrated near-commercial location services applications in the GSM environment, with callers typically pinpointed to within 5-20 meters. During the trials, mobile users were guided to featured points of interest and to hotels, ATMs, nightclubs and tourist attractions closest to their calling locations. Recent studies by Strategis Group indicate that the wireless location services market could generate as much as \$32 billion per year in revenues for European carriers and vendors by 2005.

The SnapTrack GSM Test Group consortium, formed more than a year ago, collectively supports over 30 million subscribers. Publicly disclosed members include Vodafone AirTouch Communications PLC (UK and US), BellSouth Mobility DCS (US), BT Cellnet (UK), Esat Digifone (Ireland), France Telecom (France), Omnitel Pronto Italia (Italy), T-Mobil (Germany), Telecel (Portugal) and Telefonica (Spain), and applications developer SignalSoft (UK and US). Prototype handsets were provided to the consortium for the field trials.

Infrastructure providers CMG Telecommunications (Holland), Nortel Networks (France) and Siemens Information and Communication Networks (Germany) also participated in the trials.

SnapTrack's Wireless Assisted GPS system improves upon conventional GPS by combining information from GPS satellites and from wireless networks to pinpoint a wireless handset. While conventional GPS receivers may take several minutes to provide a location fix, the SnapTrack system generally locates callers within a few seconds. With its GPS Indoors™ feature, callers can be located in a wide range of challenging call environments where conventional GPS will not work, including inside houses and moving vehicles, under heavy foliage, and in urban street canyons – usually to within 5-20 meters. The unique SnapTrack Location on Demand™ feature also ensures a caller's privacy, giving mobile phone users control over their own location information.

SnapTrack's technology products permit the design of cellular phones, pagers, PDAs, and other wireless devices that operate in multiple GPS navigation modes, allowing out-of-network location coverage and a variety of thin-client applications. SnapTrack's wireless location technology products require no Location Measurement Units installed in the network or additional cell sites, and are designed to have minimal impact on cost and handset form factor. SnapTrack's technology is air-interface neutral and is applicable in any two-way wireless system: cellular/PCS, satellite, or paging; 800/900 MHz or 1800/1900 MHz; GSM, CDMA, TDMA, PDC or 3G air interfaces.

CMG Telecommunications is the leading global supplier of messaging and Internet solutions for the wireless telecom industry. CMG develops high-end solutions in close co-operation with network operators. To date, more than 150 of these quality solutions have been delivered to over 75 operators worldwide. They are widely recognized to be the best around, combining minimum operator intervention with maximum performance and availability. The product portfolio includes the WAP Service Broker™, Mobile E-mail, Short Message Service Centre, Cell Broadcast System and EPPIX (Customer Care & Billing System). More information about CMG Telecommunications can be found on the Internet at www.cmgtele.com. CMG telecommunications is a division of CMG plc (www.cmg.com) a leading European IT services group, providing business information solutions around the world through consultancy, systems development, software applications and managed services. CMG was established in 1964 and nowadays employs around 11,000 employees. The Group is listed on the London and Amsterdam stock exchanges.

Headquartered in San Jose, Calif., SnapTrack is focused on integrating GPS and two-way wireless technologies. SnapTrack's patented architecture offers anytime, anywhere, accurate, high-speed location of a wireless caller, even inside buildings where conventional GPS does not operate. SnapTrack pioneered Wireless Assisted GPS, and owns patents that are fundamental to the cost-effective deployment of Wireless Assisted GPS-based location systems. SnapTrack has commercial agreements with Motorola, Texas Instruments, NTT