

be monitored. When switch 24 receives a call request from a subscriber, terminal 26 searches the intercept list and determines whether the subscriber making the call is one to be monitored. Since communications system 20 is within jurisdiction 12, LEA A has control of the contents of the intercept list included within terminal 26.

If subscriber 22 travels from communications system 20 into communications system 30, subscriber 22 no longer accesses communications system 20. Now when subscriber 22 wishes to place a call, he accesses communications system 30 by contacting switch 34. If subscriber 22 is to be monitored in this region, it is the responsibility of switch 34 to recognize this, intercept the call, and route it to the LEA. If LEA A wishes to monitor subscriber 22 when subscriber 22 is using communications system 30, LEA A has to get the subscriber's intercept information into the intercept list included within terminal 36. This usually entails getting permission from LEA B to monitor a specific subscriber within jurisdiction 18, and then getting the intercept list within terminal 36 modified. This way, when subscriber 22 places a call through switch 34, terminal 36 can search its own intercept list and find the information that instructs the switch to monitor the call by routing the call to LEA A.

Instead of roaming from communications system 20 to communications system 30, subscriber 22 could roam from communications system 20 to communications system 40. Now in order for subscriber 22 to be monitored, LEA A has to get the subscriber's intercept information into the intercept list included within terminal 46. Even though subscriber 22 is still within jurisdiction 12, LEA A still has to get the subscriber's intercept information into terminal 46 because subscriber 22 has roamed from one communications system to another.

For exemplary purposes, FIG. 1 shows only three jurisdictions with a common boundary. In most real situations, any one LEA jurisdiction will have many other jurisdictions with common boundaries. If an LEA wants to monitor a roaming subscriber in all adjacent jurisdictions, then the LEA typically gets permission from all appropriate LEAs and then endeavors to have the subscriber's intercept information added to all necessary communications systems.

As previously described, communications system 20 and communications system 30 have a common boundary at boundary 16 between jurisdiction 12 and jurisdiction 18. This is a simplistic example because juridical boundaries and communications system boundaries do not always coincide. Communications system 40 is an example of a communications system whose boundaries do not coincide with that of an LEA jurisdiction.

Communications system 40 is partially included within jurisdiction 12 and partially included within jurisdiction 18. In the first embodiment currently being discussed, terminal 46 includes an intercept list. If subscriber 42 is included within the intercept list, then when subscriber 42 places a call, switch 44 retrieves intercept information from terminal 46, and routes the call to LEA A for monitoring. If subscriber 42 stays within communications system 40, but travels from jurisdiction 12 to jurisdiction 18, then when subscriber 42 makes a call, switch 50 has the responsibility to route the call to LEA A. Switch 50 will consult terminal 46, and receive instructions to route the call to LEA A. This works well when LEA A and LEA B have an all encompassing reciprocal agreement regarding the monitoring subscribers in each other's jurisdictions, but otherwise is a problem.

Monitoring Location Register

The monitoring location register (MLR) comprises a method and apparatus for centralizing the management and

administration of intercept lists. MLR 10 in FIG. 1 includes a master intercept list. As previously stated with reference to a first embodiment, when any of the three communications systems shown receive a call request, they query an intercept list to ascertain whether or not the call is to be intercepted. MLR 10 simplifies the task of administering the multiple local intercept lists through the use of a master intercept list. Switches can query MLR 10 for every call request, or MLR 10 can maintain the copy of the list resident on the switch.

In the first embodiment where local intercept lists are maintained at the switches (or terminals) within the communications systems, MLR 10 simplifies the task of administration because law enforcement agencies only need to update the master intercept list in MLR 10. MLR 10 then automatically updates the multiple local intercept lists included in the different communications systems.

In a second embodiment, local lists are not maintained in the switches. Instead, each switch queries MLR 10 for every call request. MLR 10 searches the master intercept list and returns intercept information for the specific call. This second embodiment is advantageous because the MLR eliminates the need for each system to maintain the data required, and perform the logic necessary to determine whether and what form of intercept should occur.

Of course, a mixture of the first embodiment and the second embodiment can exist. For example, communications system 20 can maintain local intercept lists while the other communications systems don't, and all three communications systems will still benefit from the services provided by MLR 10. In addition, MLR 10 is not dependent on the protocol used between the subscribers to be intercepted and the systems with which they are communicating. That is to say, subscriber 22 could be using a Global System for Mobile Communications (GSM) system, an Interim Standard-41 (IS-41) system, an Integrated Services Digital Network (ISDN) line, a paging system, or any other; MLR 10 applies in all cases.

In a preferred embodiment, a representative query to MLR 10 includes information regarding the location of the subscriber. Since MLR 10 potentially services a large geographic area spanning many LEA jurisdictions, MLR 10 benefits from the knowledge of the of the user's location when ascertaining whether the call should be intercepted.

MLR 10 provides multiple advantages. Administration of systems using MLR 10 is simpler than administration of prior art systems because there is a single point of contact for worldwide surveillance. Agreements between jurisdictions are handled easier in that once agreements are made, they can be carried out within MLR 10 rather than agreeing jurisdictions having to enter redundant information in many different, disparate, communications systems.

Communications systems query MLR 10 when intercept related information is desired. In an exemplary communications system, intercept related information is desirable at multiple points in time, including but not limited to: when a call setup is attempted, when a call is established, when no successful call is established, or on change of location.

Queries to MLR 10 are preferably performed by sending information to the MLR. The information sent to the MLR preferably comprises one or more of: subscriber identity, type of call, called party, calling party, location, or time of call. The MLR uses this information to decide whether or not to intercept the call. Possible responses from MLR 10 to the querying system include:

- 1) Do nothing (no intercept);
- 2) Intercept and provide a record of the relevant call data (location, called and calling party, time of call); and