July 12, 1968

TO: Wm. N. Morris, Jr., Sheriff

FROM: Henry S. Lesh, Sr.

SUBJECT: EVALUATION OF LINK PATH VULNERABILITY AND SECURITY

The control central for Shelby County Police (Sheriff) Communications is located in the Criminal Courts Building in downtown Memphis; the actual (primary) transmitting and receiving site is located more or less centrally in the County at the Shelby County Penal Farm. This location serves to blanket the 750 square miles of the densely populated area and isolate the receiving equipment from man-made electrical noise. This location is particularly important from a noise standpoint in maintaining instantaneous mutual cooperative contact with the adjoining state police organizations of Arkansas and Mississippi for purposes of closing exit routes from Memphis and Shelby County.

There is leased private wire linkage via Bell System from the Control Central to the Penal Farm location availability. However, experience with other users of the service (leased line) over the same route has demonstrated that the service is subject to very frequent outages. Outages may go as high as 5 to 8 per month, seasonally, dependent on moisture and ground water conditions. Since the lines must travel thru the numerous central offices of each telephone company district in the city, enroute to the destination, a line problem involves hours to get corrected even during a weekday, during normal working hours. A line problem occurring at night or on a holiday, generally must wait for regular working hours for a resolution.

The problems outlined have been circumvented, to date, by the use of 450 MC U.H.F. radio link-paths. The performance of the equipment has been highly reliable. The security and virtual invulnerability of this equipment has been satisfactory up until recently.

Changing FCC rules are forcing great quantities of 450 MC U.H.F. equipment to be dumped into the junk market. While this equipment is no longer legally and commercially usable, it is functional. Experience with older type 150 MC equipment, exposed to similar rule changes a few years past, was that it found its way into many hands that did not have the best interests of law enforcement at heart, and the old 150 MC junk equipment was used to eavesdrop, etc., to the detriment of the police.

The corollary to the above is apparent. The most vulnerable point of Shelby County's police communications system could be breached for a hundred dollars or so with readily available and untraceable junk. The system could be neutralized and even commandeered with intelligence that is a matter of public record (assigned frequencies and transmitter locations).

I recommend that the 450 MC band link-paths to and from the downtown location and the Penal Farm location be replaced with 960 MC R.F. equipment, and multiplexed. Equipment of this type should offer security and relative invulnerability for at least 5 years, due to an almost total absence of any except new, known purpose, equipment in this frequency range. Projections for the next five years indicate a continuation of the same conditions to prevail as to the lack of ease in obtaining equipment for other than legitimate purposes.

An additional degree of invulnerability could be obtained by using altogether separate frequency pairs on the regular and alternate R.F. units, and periodically cross-switching of path frequencies and pairing. A great degree of security accrues from the use of multiplex, since all but the base-band is almost of scrambler security, and the base-band would be used for circuit status telemetry with no voice intelligence.

The projected cost for the above is $24,000.00. This includes the following:

4 channels with audio and keying each direction, second channel R.F. equipment back-up, spare transmitter and receiver chassis for the multiplex cabinets and a spare multiplex power supply; material incidental to installation and installation labor.