THE WORTH OF SECURITY

Dan Pike

United Cable Television Corporation
Tulsa, Oklahoma

ABSTRACT

Security is worth considerably more in a system with subscription Pay Television because more areas of potential loss, both in materials and service, are presented. This paper discusses the worth of security before and after implementation of subscription Pay Television. Treated are losses due to unauthorized connections to the cable system and losses to inadequate performance of the hardware protecting the pay service.

Decisions to pursue rigorous system security against unauthorized connections through the use of tags, locking terminators, audits, and closely controlled office procedures and supervision have previously been made using reduced theft of basic cable service alone as the benefit to be weighed against the cost. With the introduction of pay cable these considerations expand to many other areas which may very well establish the worth of security to be far above its cost.

Perhaps the most significant costs readily determined are the material costs that are lost to an illegal, or more correctly an unauthorized drop. Assuming a trapped system using a popular technique in which 100% trapping is conducted before the implementation of the pay service and subsequently the traps are removed from the drops of the pay cable subscribers, it follows that a trap will be installed on every illegal drop in the system and the direct material cost of that trap and the cost of its installation is a direct dollar outlay that will never be recovered. While the exact number of unauthorized drops in any given system is quite a debatable figure, it is generally established as a percentage of paying customers and may be ranged conservatively between five and forty percent. Documented examples show that a major market system where locking terminators and drop identification tags were used from the beginning phases of the system may have 10% unauthorized connections quite easily, and further work has shown that two separate independent sample audits performed on a major market system not using locking terminators revealed a 25 to 30% unauthorized rate there. Certainly existing traditional 12-channel systems having the accumulated unauthorized drops of several years that occur without the use of locking terminators or tags and other security measures may well approach 25%. Some factors contributing to the unauthorized drops, to be distinguished from illegal drops, may be office error, disconnects not performed, and errors of that nature rather than the deliberate and illegal connection by a subscriber to the cable system. Estimates in the number of unauthorized connections as a percentage of the total of unauthorized and illegal drops approach 95%.

For the purpose of examining the worth of security, a 10% unauthorized rate will be assumed. In addition to the cost of the material that would not be lost if adequate security were practiced, the reasonably recoverable revenue must be considered that will be gained from the use of security measures. Reasonably recoverable revenue is also quite a debatable figure and different audits have turned up many different percentages of recovered subscribers, but since audits are seldom measured for efficiency and marketing conversion procedures are very seldom performed in a consistent and well-defined manner a given figure cannot be derived. There is, however, reasonable documentation to support a 25% recovery of illegals and a 25% recovery of that number to the pay service and the revenue accrued from those percentages based on the given service rates for both basic and pay will be assumed to be the reasonably recoverable revenue that can be attributed to the worth of security.

To graphically depict these conditions the following assumptions will be made: 10% of basic subscribers are unauthorized or illegal; 25% of those are recovered to basic service; 25% of that number is recovered to the pay service; traps cost $5; their installation costs $1.50; basic service price if $7 per month and basic pay service costs $10 per month. The costs of audit will be assumed to be $.40 per home passed. In order to get a reasonable cross section of data, this material is drawn from four systems and the experiences enjoyed during the implementation of pay television in them. Two were major market systems built within the last three years and two were traditional 12 channel systems. Their locations vary between the central U.S. and each coast. Example I depicts these conditions and establishes that the basic plus pay reasonably recoverable revenue would be equal to the cost

of the audit in a little less than four months. A line with that slope is added to the loss of material expected with a 10% unauthorized rate and yields about a one-month recovery against the cost of the audit. Included in example one for reference purpose are the losses incurred in material for the previous case which shows that material losses alone based on the past experience in those four systems, which can be construed as a reasonable cross section of the industry, may well exceed the cost of the audit.

From Example 1 it may be concluded that revenue realized from recovered unauthorized connections added to material otherwise lost revenue is significantly greater, even in the short term, than the costs of security hardware and technique.

There are other areas of consideration that are somewhat less tangible that should be appraised in the worth of security. Consider the case of a remarket campaign where certain fees are waived or other concessions are made in an effort to gain subscribers. Certainly the amount of customers are known in a particular system and if the amount of illegals are estimated based on this number of known customers, then the number of customers, plus the number of illegals must be subtracted from the potential in order to know the number of homes that are potentially marketable. It stands to reason that existing cable customers and existing unauthorized connections will not be interested by any type of remarketing effort. Example 2 shows the percent of available customers for remarket plotted against percent saturation for three given unauthorized rates. These percentages are of potential to weigh out the various saturations of many different systems. The important point to realize is that traditional 12 channel systems which fall in the highly saturated areas have a great deal to gain in terms of the percentage of their potential customers who are interested in any kind of a remarket effort if they first reduce their unauthorized percentage rates to get on a more linear portion of these curves.

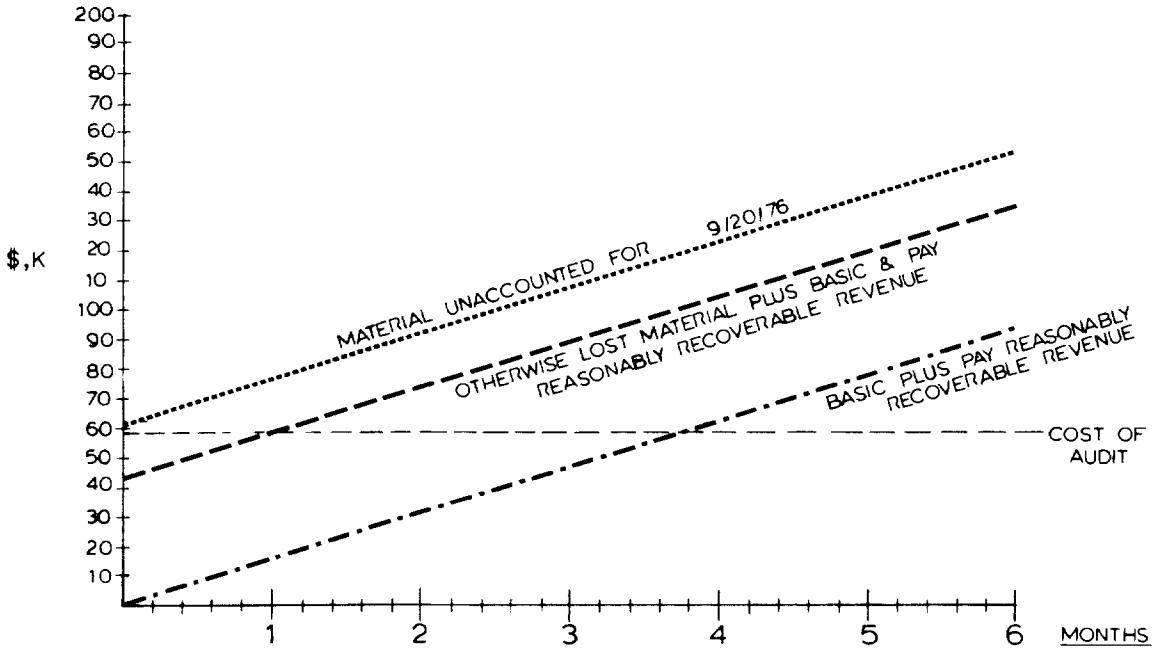
Further enforcing the worth of security is the intangible but quite logical line of reason that a subscriber converted from an unauthorized condition is much more likely to remain on the system since the service was appealing enough to steal or more probably was appealing enough that when given to him by office error or employee error he did not see fit to report it to the cable office. His propensity to stay on the cable is a great deal higher than the subscriber who is enticed to get on the cable by some concessions in fees or other sales approaches whose propensity to remain on the system decays rapidly when those run out. A quick comparison of dollars per subscriber made after a 90 day wait so that fluctuations caused by embarrassed unauthorized or illegal subscribers and those who are after something for nothing could die down could very well show that the recovered subscriber is worth more money in the long run than the remarketed subscriber and could very well cost less to recover.

Inadequate performance of the hardware selected to protect the pay service can also find its way into the worth of security if security is envisioned to include the maintenance of those devices, as it well should be, since very stringent efforts on security can never recover a basic cable subscriber that receives the pay service because of a faulty trap. There have been several efforts to define the minimum limits of these devices in order to secure a pay system against voluntary or unvoluntary theft of the service. A program should be established to accurately determine that the performance of those devices remains acceptable through their entire life. Recently it was documented that a subjective opinion by technically qualified people that would indicate 98% effectiveness of the units could occur at the same time that an analytical testing would show 15% effectiveness of those same units and it serves to show that subjective opinions by trained service technical people are based on the entirely different reference of a quality picture where subscriber acceptance and analytical testing are based on "something for nothing" or a given set of parameters, and the two have little or no correlation. Customer attitude would support the analytical opinion in the previously mentioned documentation. Very strict interpretations must be made if subjective evaluations are used to determine compliance with system parameters and effectiveness of the devices in the protection of the pay signal. The revenue from the estimated number of subscribers, yet undocumented, that would otherwise subscribe to the premium service that do not because of marginal or faulty hardware must be included to determine the worth of security.

With a so-called positive device used in the home as a vehicle of delivery for the pay channel, be it a descrambler or decoder or converter or combination of those, the primary security effort lies in the recovery of those units from the churn encountered from all various reasons for the churn. Every unit not recovered is a loss in material dollars plus a loss of service dollars for the useful life of the product. With only moderate effort extended towards the recovery of those devices, approximately 75% may be assumed to be the recovery rate, and very strict efforts are required to recover all of the units that are put into the field. In addition, inventories must be very closely controlled and distribution prodecures very carefully monitored. Approximately 25% of the active customers per year may be assumed as a ball-park churn figure and if one out of four of those units are not recovered, the material dollars plus the loss of service dollars can well add up to more than the required cost of a more secure program. Documented churn factors, like documented recovery rates, vary widely and have approached 100% in some areas of certain systems.

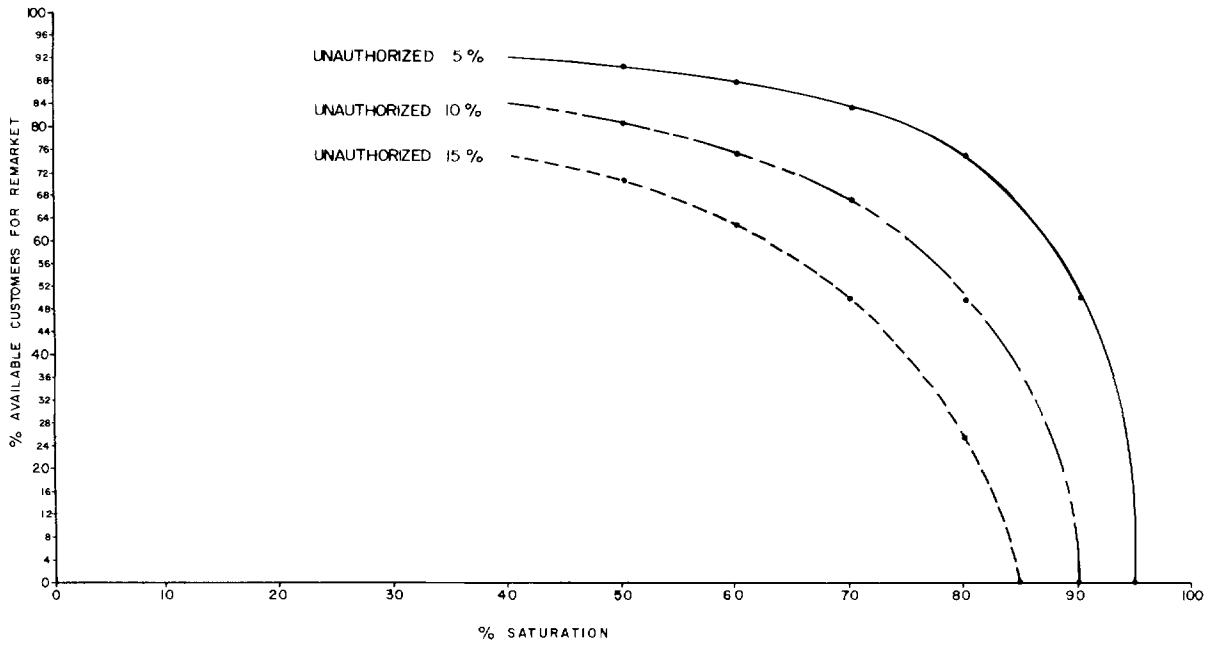
The primary objective of this dicussion has been to point out using figures from actual experience and best estimates that security and its benefits must now be considered as they relate to

many areas previously left out of the decision, especially with the introduction of pay television into any system with any type distribution scheme. The net result is that the worth of security extends into many, many areas, most of which are intangible in terms of absolute dollars, but certainly the conclusion to be drawn is that the decision for security quite clearly must come out in its favor.



EXAMPLE 1

EXAMPLE 2



REFERENCES

BOSTICK, Glynn, "Trap Selection--Some Notes on Basics." Unpublished article, Microwave Filter Company, October, 1975.

DERICK, Christopher and others, "Security-An End in Sight to This Bottleneck?" Pay Cable Session, California Cable Television Association, Anaheim, California, December, 1976.

PIKE, Dan, "Desired Specifications of Pay Cable Traps," 25th Annual NCTA Convention Technical Papers, p. 26-101.

WILBANKS, Jim, Personal interview, October, 1976.

WILSON, Roger, "Pay TV Filters, " COMMUNICATIONS ENGINEERING DIGEST, Vol. 1, No. 2, November, 1975, p. 21.