88 年度下半年暨 89 年度國家標準實驗室計畫執行成果摘要表
論文

計畫名稱	中文	建立及維持我國時間與頻率國家標準		
計畫編號	英文	The Maintenance and New Technology Establishment of National Standard for Time and Frequency		
計畫編號	TL-001-P301(89)			
執行單位	中華電信研究所		執行期間	88 年 7 月至 89 年 12 月
主持人	廖 嘉 旭		協同主持人	
分項主持人			連絡電話	(03)424-4441
成 果 名 稱	中文	使用 GPS 載波相位完成同步時頻之研究		
	英文	Synchronized Clock Using GPS Carrier Phase Measurements		
撰 寫 人	陳 商 銜	涂 昆 源	廖 嘉 旭	
撰寫日期	中 華 民 國 89 年 10 月 20 日		撰寫語言及頁數	英文 5 頁
解密期限	中 華 民 國 年 月底解密		機密級	
關鍵詞	synchronized clock			
	GPS			
	carrier phase observations			

內容摘要：

A synchronized clock using all-in-view GPS (Global Positioning System) carrier phase observations is presented. In order to estimate the frequency offset of the remote OCXO (Oven Control Crystal Oscillator) clock with respect to the primary cesium atomic clock, both clocks are connected to the Ashtech GPS receivers, G-12, respectively. By performing the carrier-phase single-difference (differences between two receivers) and time-difference (differences between two epochs), we can estimate the frequency offset of remote clock with respect to the primary clock. In our system, the GPS carrier-phase data and other observation messages are passed between both stations through PSTN (Public Switched-Telephone Network). The frequency offset and its change with respect to time are then fed into the controller, which automatically issues a command to keep frequency accuracy within an acceptable range. Through a D/A converter, the remote clock then can be steered to synchronize with the master clock. For verifying our system, the experiments have been conducted. The remote station was built at Standard Time and Frequency Broadcast station, called sign BSF, which is five kilometers apart from the master station built at TL (Telecommunication Laboratories). Based on the proposed architecture, the frequency traceability can be achieved. Experimental results show that our system is sound and cost-effective. The accuracy of the remote clock could be improved from about 3e-9 to 3e-13 for averaging times of one day. The proposed system will be used to establish the frequency source for telecommunication networks and calibration laboratories in Taiwan.