A Dissertation On

# Dynamic Troubleshooting Of Specific ETR-290 Alarms in a MPEG Transport Stream

Submitted in Partial fulfillment of the requirement For the award of Degree of

## MASTER OF TECHNOLOGY (VLSI DESIGN & EMBEDDED SYSTEM)

Submitted By: ANUJ PANCHAL University Roll No: 07/VLSI/09

Under the Guidance of: **Mr RAJESH ROHILLA** (ASSOCIATE PROFESSOR)



DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING DELHI TECHNOLOGICAL UNIVERSITY, DELHI (FORMERLY DELHI COLLEGE OF ENGINEERING) 2009-2011

#### **DELHI TECHNOLOGICAL UNIVERSITY, DELHI**

Department of Electronics & Communication Engineering



CERTIFICATE

This is certified that the dissertation entitled "**Dynamic Troubleshooting Of Specific ETR-290 Alarms in a MPEG Transport Stream**" is a work of Anuj Panchal (University Roll No. 07/VLSI/09), a student of Delhi Technological University. This work was completed under my direct supervision and guidance and forms a part of the Master of Technology (VLSI Design and Embedded System) course and curriculum. He has completed his work with utmost sincerity and diligence.

The work embodied in this major project has not been submitted for the award of any other degree to the best of my knowledge and belief.

**Rajesh Rohilla** 

Associate Professor ECE department Delhi Technological University Delhi-110042

# ACKNOWLEDGEMENT

It is distinct pleasure to express my deep sense of gratitude and indebtedness to my project guide **Mr. Rajesh Rohilla,** Associate Professor, Department of Electronics and communication, Delhi Technological University, for his invaluable guidance, encouragement and patient reviews. His continuous inspiration only has made me complete this dissertation. Without his help and guidance, this dissertation would have been impossible. He remained a pillar of help throughout the project.

I am deeply thankful to **Prof. Rajiv Kapoor**, H.O.D., Electronics and Communication Engineering and **Prof. Ashok Bhattacharyya** (former H.O.D.) for their motivation and inspiration, at the same time I am very thankful to the entire faculty and staff members of Electronics & Communication Engineering Department for their direct or indirect help, cooperation, love and affection.

At last, I am grateful to my parents, classmates and my friends for their moral support all the time. They have been always around to cheer me up in the odd times of this work.

Anuj Panchal (07/VLSI/09)

# ABSTRACT

The current scenario of Transport stream Monitoring and Analyzing is such that we are doing the analysis of the Transport Stream at the output end i.e. the Streams are analyzed at the receiver end and then the Troubleshooting is done by manually doing the required change and therefore is not dynamic.

In this project the work has been done to analyze the output Transport stream just after the multiplexer output, and make changes to the transport stream after analyzing the stream for a specific ETR 290, Priority 1 alarm . All this is done without manual interception.

For the real-time environment, the generated stream after Satellite Transmission are received back via a Ku,C band antenna and then are analyzed..

In this project the real time environment is simulated in the Multiplexing code itself .The Analyzer monitors the Multiplexed stream for a specific ETR-290 alarm and will make necessary changes in the repetition frequency of the that specific PID packet.

The specific ETR-290 alarm we have taken here is PAT\_error.

The entire process takes place within the same Block wherein we don't have to Increase or Decrease the Frequency of reception of a PAT packet by manually inserting the time frame. Here the Analyzer itself measure the PAT packet frequency and itself makes the adjustment whether to increase or decrease the frequency of that PAT packet by looping back to the multiplexer which generate PAT Packet.

Page No.

#### Chapter 1: Introduction

	1.1 Introduction	1
	1.2 Basic Multiplexing Approach	2
	1 3 Transport Stream	<b>`</b> 2-3
	1.4 Program Stream	3
	1.5 Conversion between program Stream and Transport stream.	4
	1.6 Packetized Elementary Stream	4-5
	1.7 Timing Model	5
	1.8 Conditional Access	5
	1.9 Synchronization	6
Chapter 2:	TS and PES packet details and Information used for	7
	Decoding at Receiver	
	a) Packetized Elementary Stream contents and parameters	
	2.1a Packetized Elementary Stream in Detail .	7-8
	2.2a The packetized Elementary Stream Packet	9
	2.3a Semantic definition of fields in PES packet	10-11
	b) Transport Stream contents and parameters	
	2.4b Multiplexed MPEG-2 transport stream packet.	12
	2.5b The MPEG-2 Transport Stream Packet	13-14
	2.6b Basic Information in Transport stream Packet required	15
	at decoder Level.	
	2.7b Information for the Receiver	15-16
	2.8b Synchronizing to the Transport Stream	17-18
	2.9b ETR -290 alarms	18-19

## Chapter 3: Proposed Work

3.1 Introduction	20
3.2 Missing or Error Program Association Table (PAT)	21
PAT_error`	
3.3 Project Stages	22
3.3.1 Project Stage 1	22-26
3.3.2 Project Stage 2	26-27
3.3.3 Project Stage 3	

29

## Chapter 4: Results Achieved

	Bibliography	39-40
Chapter 5:	Summary , conclusion and future direction .	37-38
	the frequency of repetition of PAT packets.	
	4.8 Troubleshooting PAT_Error By Decreasing	36
	4.7 Showing Specific ETR-290 Alarm, PAT_Error	35
	alarm Identification	
	4.6 Transport Stream Analyzing and ETR_290	34
	4.5 Running analyzer	33
	W.r.t time in milliseconds	
	4.4 Transport Stream packet generation Diagram	32
	4.3 Generating Transport Stream	31
	4.2 Generating Elementary Streams	30
	troubleshooting options.	
	4.1 GUI based transport stream generator with analyzing and	29