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Colin Hinson
In the village of Blunham, Bedfordshire.

TMS 3551
Data Manual

Packet Identifier
(UK Broadcast Teletext)

Video Display Products

TEXAS
INSTRUMENTS

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TMS 3551
Data Manual

Packet Identifier (U.K. Broadcast Teletext)

TABLE OF CONTENTS

1 - INTRODUCTION

BROADCAST TELETEXT IS A SERVICE THAT CAN PERMIT, WITH SUITABLY EQUIPPED TELEVISION RECEIVERS, THE RECEPTION OF TEXT AND PICTORIAL INFORMATION OVER THE NORMAL TELEVISION BROADCASTING CHANNELS.

TELETEXT BROADCASTING INFORMATION CAN BE TRANSMITTED IN DIGITALLY CODED FORM ON TELEVISION LINES NOT CARRYING NORMAL TELEVISION PICTURE SIGNALS THIS IS SOMETIMES REFERRED TO AS VERTICAL (OR FIELD) BLANKING INTERVAL TRANSMISSION (VBI).

PLANNED EXTENSIONS TO THE ABOVE SYSTEM CAN TRANSMIT THE TELETEXT INFORMATION DURING ALL TV LINES. FULL FIELD TRANSMISSION (FFT).

THE MAXIMUM INFORMATION THAT CAN BE TRANSMITTED DURING ONE TV LINE IS DETERMINED BY THE TV BROADCAST STANDARD AND THE BANDWIDTH OF THE TV RECEIVER.

THE TELETEXT INFORMATION THAT IS TRANSMITTED DURING ONE TV LINE IS REFERRED TO AS A PACKET. A PACKET IS TRANSMITTED IN DIGITAL SERIAL NON RETURN TO ZERO (NRZ) FORM. EIGHT PROPERLY SYNCHRONIZED BITS (BYTE) CONSIST OF THE SMALLEST ELEMENT OF INFORMATION TO BE DECODED FROM THE PACKET.

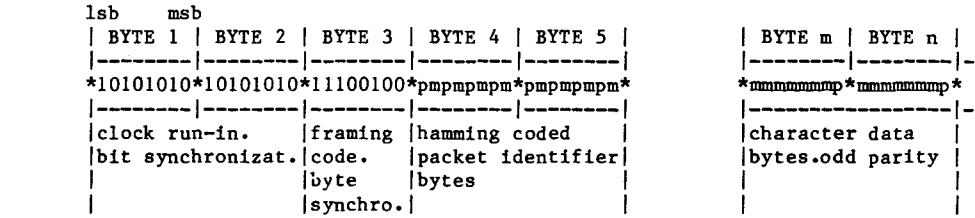
THE INFORMATION CONTAINED IN A PACKET AND COMMON TO MOST TELETEXT STANDARDS IS:

- SYNCHRONIZATION : BIT SYNCHRONIZATION.
  BYTE (FRAME) SYNCHRONIZATION.

- PREFIX : SOURCE IDENTIFICATION, ERROR DETECTION/CORRECTION AND OTHER CONTROL INFORMATION.

- DATA : SOURCE/HEADER IDENTIFICATION, ERROR DETECTION/CORRECTION, DISPLAY CHARACTER/GRAPHICS CODES, OTHER CONTROL INFORMATION.

EXAMPLE :



p = protection bits m = data bits
LSB is sent first.

A COMPLETE TELETEXT RECEIVING SYSTEM CONSIST OF FIVE MAJOR PARTS.

1 - TV RECEIVER TO RECOVER THE VIDEO SIGNAL.

2 - EXTRACTION/SHAPING OF BINARY CODED DATA STREAM FROM THE COMPOSITE VIDEO SIGNAL. THIS FUNCTION IS PERFORMED BY TI'S SN 96533 TELETEXT DATA SLICER.(SEE REFERENCES IN ANNEX).

3 - BYTE SYNCHRONIZATION, PREFIX EXTRACTION AND PROCESSING. PRESENTLY PERFORMED BY TI'S TMS 3534 WHICH WAS DESIGNED TO SATISFY THE ANTIOPE STANDARD. THIS SPECIFICATION WILL DESCRIBE THE TMS 3551 DESIGNED TO DEMULTIPLEX UK625 AND UK525 BROADCAST TELETEXT STANDARDS.

4 - DECODING/STORAGE OF DISPLAY INFORMATION AND OVERALL SYSTEM CONTROL. TI'S TMS 7000 FAMILY MICROPROCESSORS AND MEMORIES.

5 - VDP VIDEO DISPLAY PROCESSOR TI'S TMS 3556.

THE TMS 3551 PACKET IDENTIFIER CAN :

- CONVERT THE INCOMING DATA STREAM FROM SERIAL TO PARALLEL FORM.

- IDENTIFY THE FRAMING CODE TO ACHIEVE BYTE SYNCRONIZATION.

- DO HAMMING ERROR DETECTION/CORRECTION ON CONTROL BYTES AND PARITY ERROR DETECTION ON DATA BYTES.

- IDENTIFY MAGAZINE; ROW AND PAGE.

- PASS (OR REJECT) HAMMING TESTED (CORRECT ONE ERROR, FLAG MORE THAN ONE ERROR) BYTES TO THE DATA PORT.

- REPOSITION THE BITS OF THE HAMMING TESTED BYTES ON THE OUTPUT DATA PORT

- PASS PARITY TESTED/ERROR DETECTED/BYTES TO THE DATA PORT.

- BE PROGRAMMED TO SELECT THE ;
  - DIFFERENT STANDARDS.
  - VARIOUS MODES OF OPERATION .
  - FRAMING CODE SEARCH VALUE.
  - "LEAD BYTE CODE".
  - PARITY ERROR "FILL CHARACTER".

2 - STANDARDS/MODES/OPERATION DESCRIPTION

2.1 STANDARDS DESCRIPTION.

2.1.1 UKT 625 STANDARDS DESCRIPTION.

BYTE NUMBERS 1 AND 2 ARE CLOCK-RUN-IN.

BYTE NUMBER 3 IS FRAMING CODE.

BYTE NUMBERS 4 AND 5 ARE MAGAZINE(X) AND ROW(Y)

BYTE NUMBERS 6 THRU 45 ARE INFORMATION, CONTROL OR CHARACTER BYTES.
BYTE IDENTITY/FUNCTION IS DETERMINED BY THE PACKET
BYTE NUMBER/ ROW ADDRESS.

45 BYTES/PACKET

ROW 0 IS THE HEADER ROW.

ROWS 1 TO 23 ARE DISPLAY ROWS.

ROWS 24,25 ARE OPTION ROWS

ROWS 26,27,28, 30 ARE LEVEL EXTENSION ROWS

ROWS 29, 31 ARE NOT DEFINED.

LEVEL	DECODER RESPONDS TO :
1	X/0 TO X/23 ; WHERE X/Y IS MAG/ROW
1 OPTION	X/24 AND X/25 ;
1 OPTION	X/27 AND 8/30 ;
2	LEVEL 1 PLUS PACKETS X/26; X/28
3	LEVEL 2 PLUS ADDITIONAL CODES IN THE HEXADECIMAL RANGE DYNAMICALLY REDEFINABLE CHARACTER SETS (DRCS)
4	LEVEL 3 PLUS ADDITIONAL DATA FOR PROCESSING ALPHAGEOMETRIC DISPLAY.
5	LEVEL 3 PLUS ADDITIONAL DATA FOR PROCESSING ALPHAPHOTOGRAPHIC DISPLAY.

2.1.2 UKT 525 STANDARDS DESCRIPTION.

BYTE NUMBERS 1 AND 2 ARE CLOCK-RUN-IN.

BYTE NUMBER 3 IS FRAMING CODE.

BYTE NUMBERS 4 AND 5 ARE MAGAZINE(X)/TABULATION(T)/ROW(Y)

BYTE NUMBERS 6 THRU 37 ARE INFORMATION, CONTROL OR CHARACTER BYTES.
BYTE IDENTITY/FUNCTION IS DETERMINED BY THE PACKET
ROW ADDRESS AND THE BYTE NUMBER.

37 BYTES/PACKET

ROW 0 IS THE HEADER ROW.

ROWS 1 TO 23 ARE DISPLAY ROWS.

ROWS 24,25 ARE OPTION ROWS

ROWS 26,27,28, 30 ARE LEVEL EXTENSION ROWS

ROWS 29, 31 ARE NOT DEFINED.

LEVEL	DECODER RESPONDS TO :
1	X/0/0 TO X/T/23 ; WHERE X/T/Y IS MAG/TAB/ ROW
1 OPTION	X/T/24 AND X/T/25 ;
1 OPTION	X/T/27 AND 4/1/30 ;
2	LEVEL 1 PLUS PACKETS X/0/26; X/0/28
3	LEVEL 2 PLUS ADDITIONAL CODES IN THE HEXADECIMAL RANGE DYNAMICALLY REDEFINABLE CHARACTER SETS (DRCS)
4	LEVEL 3 PLUS ADDITIONAL DATA FOR PROCESSING ALPHAGEOMETRIC DISPLAY.
5	LEVEL 3 PLUS ADDITIONAL DATA FOR PROCESSING ALPHAPHOTOGRAPHIC DISPLAY.

2.1.3 ANTIOPE LONG PREFIX STANDARDS DESCRIPTION.

BYTE NUMBERS 1 AND 2 ARE CLOCK-RUN-IN.

BYTE NUMBER 3 IS FRAMING CODE.

BYTE NUMBERS 4, 5, AND 6 ARE MAGAZINE A1, A2, A3

BYTE NUMBERS 7 IS CONTINUITY INDEX I

BYTE NUMBERS 8 IS PACKET STRUCTURE F

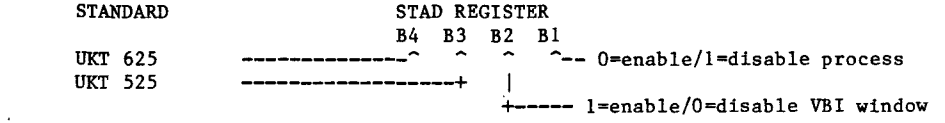
BYTE NUMBERS 9 THRU N ARE INFORMATION, CONTROL OR CHARACTER BYTES.
ROW IDENTITY/ START OF ARTICLE/END OF ARTICLE, ETC..

N BYTES/PACKET. THE NUMBER OF BYTES/PACKET IS DETERMINED BY THE HEXADECIMAL VALUE OF THE HAMMING CODED BYTE 8 (F=PACKET STRUCTURE) AND THE PACKET STRUCTURE "LIST" SELECTED. LIST 1 THRU 4.

USE THE TMS 3534 FOR ANTIOPE TELETEXT STANDARDS DEMULTIPLEXING.

2.1.4 PROGRAMMING STANDARDS

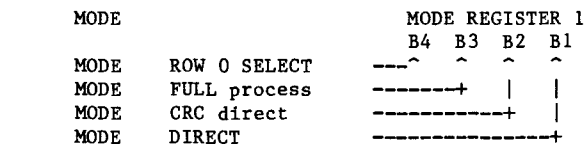
THE UKT 625 STANDARD IS SELECTED WHEN BIT 4 OF THE STANDARDS REGISTER IS SET AND BIT 3 IS RESET. THE UKT 525 STANDARD IS SELECTED WHEN BIT 3 IS SET AND BIT 4 IS RESET.



2.2 MODES DESCRIPTION.

2.2.1 PROGRAMMING MODES

OPERATING MODES ARE SELECTED BY PROGRAMMING THE MODE CONTROL REGISTER



MODE REGISTER.

b4	b3	b2	b1	
1				ALL ROW ZEROS (REGARDLESS OF THE MAGAZINE SELECTED) WILL BE SENT TO THE OUTPUT DATA PORT.
0				ONLY ROW ZEROS, CORRESPONDING TO THE MAGAZINE SELECTED WILL BE SENT TO THE OUTPUT DATA PORT. THIS MODE WILL BE VALID IN THE CRC DIRECT MODE AS WELL AS THE FULL PROCESS MODE
X	1	0	0	FULL PROCESS MODE : THE TMS 3551 WILL FUNCTION AS DESCRIBED IN SECTION 2.3 TMS 3551 OPERATION TO STANDARDS (FULL PROCESS MODE).
X	0	1	0	CRC DIRECT MODE : ALL BYTES RECEIVED AFTER BYTE 13 IN ROW 0 WILL BE SENT TO THE OUTPUT DATA PORT UNCHANGED. ALL BYTES RECEIVED AFTER BYTE 5 IN ROWS 1 TO 25, WILL BE SENT TO THE OUTPUT DATA PORT UNCHANGED. ROWS 26,27, 28 AND ROW 30 WILL BE PROCESSED AS IN THE FULL PROCESS MODE.
X	0	0	1	DIRECT MODE : ALL BYTES RECEIVED AFTER DETECTION OF THE FRAMING CODE WILL BE SENT TO THE OUTPUT DATA PORT UNCHANGED.

2.3 TMS 3551 OPERATION TO THE STANDARDS (FULL PROCESS MODE)>

BEFORE ACCEPTING PACKETS CORRECTLY, THE TMS 3551 MUST BE PROGRAMMED ;

- STAD : STANDARD CONTROL REGISTER.
- MODE : MODE CONTROL REGISTES.
- FCVR : FRAMING CODE VALUE COMPARE REGISTERS.
- LEAD : LEADING BYTE VALUE REGISTERS.
- CHAR : PARITY ERROR CHARACTER FILL BYTE VALUE REGISTERS.
- MAGX : MAGAZINE COMPARE REGISTER.
- PAGU : PAGE UNITS COMPARE REGISTER.
- PAGT : PAGE TENS COMPARE REGISTER.

2.3.1 UK TELETEXT OPERATION

BYTE NUMBERS 1 AND 2 ARE CLOCK RUN-IN.

BYTE NUMBER 3 IS FRAMING CODE.

BYTE NUMBERS 4 AND 5 ARE MAGAZINE(X)/ROW(Y)

BYTE NUMBERS 6 THRU 45 (BYTE 37 FOR UKT 525) ARE INFORMATION, CONTROL OR CHARACTER BYTES. BYTE IDENTITY/FUNCTION IS DETERMINED BY THE U.K. TELETEXT STANDARD, THE PACKET ROW ADDRESS AND THE BYTE NUMBER.

AFTER THE FRAMING CODE IS DETECTED BYTES 4 AND 5 ARE HAMMING TESTED. IF MORE THAN ONE ERROR EXISTS ON EITHER BYTE, THE PACKET IS REJECTED AND NO DATA IS SENT TO THE DATA OUTPUT PORT.

IF BYTE 4, MAGAZINE BYTE, IS CORRECT (OR CAN BE CORRECTED) THEN THE MAGAZINE BITS IN BYTE 4 ARE COMPARED TO THE MAGAZINE SELECTION REGISTER AND IF EQUAL, THE MAGAZINE FOUND FLAG IS SET. THE MAGAZINE FOUND FLAG IS RESET AT THE BEGINNING OF EACH NEW PACKET LINE RECEIVED.

IF BYTE 5 IS CORRECT (OR CAN BE CORRECTED), THE ROW NUMBER IS DECODED, IDENTIFIED AND STORED. IF ROW ZERO, CORRESPONDING TO THE SELECTED MAGAZINE, IS RECEIVED THE NEXT TWO BYTES RECEIVED, PAGE BYTES, ARE COMPARED TO THE PROGAMMABLE PAGE SELECTION REGISTERS AND IF EQUAL THE PAGE FOUND FLAG IS SET.

THE PAGE FOUND FLAG IS RESET WHEN A NEW WRITE IS MADE INTO EITHER ONE OF THE PROGRAMMABLE PAGE SELECTION REGISTERS.

2.3.1 UK TELETEXT OPERATION (CONTINUED).

THE REMAINING PROCEDURES WILL BE DETERMINED BY THE ROW NUMBER FOUND.

- ROW 0 FOUND, SEND ALL ZERO ROWS MODE SELECTED: IF NO HAMMING ERRORS ARE DETECTED ON BYTES 4 AND 5 (MAGAZINE AND ROW BYTES), THEN THE ROW ZERO PACKETS ARE SENT TO THE OUTPUT DATA PORT.

- ROW 0 FOUND, SEND ALL ZERO ROWS MODE NOT SELECTED: IF NO HAMMING ERRORS ARE DETECTED ON BYTES 4 AND 5 (MAGAZINE AND ROW BYTES), THEN THE ROW ZERO PACKETS, CORRESPONDING TO THE SELECTED MAGAZINE, ARE SENT TO THE OUTPUT DATA PORT.

WHEN ROW ZERO IS FOUND, IN EITHER OF THE ABOVE CASES, THE FOLLOWING WILL OCCUR.

IF THE MAGAZINE FOUND FLAG IS ACTIVE AND THE HAMMING TESTS ARE OK FOR BYTES 5,6 AND 7 THEN BYTES 6 AND 7 ARE COMPARED TO THE PAGE SELECTION REGISTERS AND IF EQUAL THE PAGE FOUND FLAG IS SET. IF THE COMPARISONS ARE MADE AND FOUND NOT EQUAL THEN THE PAGE FOUND FLAG IS RESET.

IF THE MAGAZINE FOUND FLAG IS ACTIVE AND THE HAMMING TESTS INDICATE MORE THAN ONE HAMMING ERROR (HAMMING ERROR FLAG SET) ON BYTES 6 OR 7 THEN THE PAGE COMPARISON IS NOT MADE ON THE ERROR BYTE AND THE FLAG IS UNCHANGED.

- ROWS 1 TO 25 FOUND; IF NO HAMMING ERRORS ARE DETECTED ON BYTES 4 AND 5, THE CORRECT MAGAZINE IS FOUND, AND THE PAGE FOUND FLAG HAS BEEN SET, THEN THE PACKETS ARE SENT TO THE OUTPUT DATA PORT.

- ROWS 26,27 OR 28 FOUND; IF NO HAMMING ERRORS ARE DETECTED ON BYTES 4 AND 5, THE CORRECT MAGAZINE IS FOUND, AND THE PAGE FOUND FLAG HAS BEEN SET, THEN THE PACKETS ARE SENT TO THE OUTPUT DATA PORT.

- ROWS 30 MAG 8 (MAG4/TAB1 UKT 525) FOUND; IF NO HAMMING ERRORS ARE DETECTED ON BYTES 4 AND 5 THEN THE PACKETS ARE SENT TO THE OUTPUT DATA PORT.

- ROWS 29 OR 31 FOUND THE PACKET IS REJECTED.

2.3.1 UK TELETEXT OPERATION (CONTINUED).

IN ALL CASES WHEN VALID PACKETS ARE TO BE SENT TO THE OUTPUT DATA PORT, THE DATA WILL BE POSITIONED ON THE OUTPUT DATA PORT AS FOLLOWS:

BYTE SENT / FUNCTION	OUTPUT DATA PORT BIT POSITIONS D0	D1	D2	D3	D4	D5	D6	D7
FIRST BYTE: HEX CODE STORED IN THE LEADING BYTE VALUE REGISTERS (LEAD). HEX CODE FF RECOMMENDED.	1	1	1	1	1	1	1	1
SECOND BYTE: MAGAZINE (AND TAB FOR UKT 525).	b2	b4	b6	x	0	0	0	1
THIRD BYTE : ROW NUMBER	b8	b2	b4	b6	b8	0	0	1
MAG BYTE,bit 8 / ROW BYTE	^	^	^	^	^			
4 BIT HAMMING CODED BYTES: correct hamming.	b2	b4	b6	b8	0	0	0	1
more than one error.	b2	b4	b6	b8	0	0	1	1
CHARACTER CODED BYTES: no errors	b1	b2	b3	b4	b5	b6	b7	0
CHARACTER CODED BYTES, error detected	1	1	1	1	0	0	0	1

IF AN ODD PARITY ERROR IS DETECTED THE BYTE SENT WILL BE THE HEX CODE STORED IN THE FILL CHARACTER VALUE REGISTERS (CHAR). HEX CODE 8/F RECOMMENDED.

DIRECTLY SENT BYTES.	b1	b2	b3	b4	b5	b6	b7	b8

2.3.2 UKT 625 OPERATION :

ROW 0 FOUND.

CASE 1 - ROW 0 FOUND : SEND ALL 0 ROWS MODE SELECTED.

BYTE	PROCESS	COMPARE/FLAG	STORE	SEND_BUF_1	BUFFER_2	BUFFER_3	HMP
1,2	INIT		x	x	x	x	na
3	FC search		x	x	x	x	na
4	HAMM_4	MAG MFFG	MAG	HEX FF	x	x	na
5	HAMM_ROW	decode row	ROW	MAG	HEX FF	x	na
6	HAMM_4	PAGEunits	PAGE u	ROW	MAG	HEX FF	A
7	HAMM_4	PAGtens PFFG	PAGE t	PAGE u	ROW	MAG	A
8	HAMM_4		BYTE 8	PAGE t	PAGEu	ROW	A
9	HAMM_4		BYTE 9	BYTE 8	PAGEt	PAGEu	A
10	HAMM_4		BYTE 10	BYTE 9	BYTE 8	PAGEt	A
11-13	HAMM_4		BYTE 11-13	BYTE 10-12	BYTE 9-11	BYTE 8-10	A
14-45	PARITY		BYTE 14-45	BYTE 13-44	BYTE 12-43	BYTE 11-42	A
46	trailing byte.		x	BYTE 45	BYTE 44	BYTE 43	A
47	trailing byte.		x	x	BYTE 45	BYTE 44	A
48	trailing byte.		x	x	x	BYTE 45	A
49	EOP init.						na

43 TOTAL BYTES SENT TO OUTPUT DATA PORT.

na = HMP clock is not active. A = HMP clock is active.

CASE 2 - ROW 0 FOUND : SEND ALL 0 ROWS MODE SELECTED TO ONLY SEND ROW ZERO'S CORROSPONDING TO THE MAGAZINE SELECTED.
SEND BYTES ONLY IF MAGAZINE FOUND FLAG IS SET.

BYTE	PROCESS	COMPARE/FLAG	STORE	SEND_BUF_1	BUFFER_2	BUFFER 3	HMP
1,2	INIT		x	x	x	x	na
3	FC search		x	x	x	x	na
4	HAMM_4	MAG MFFG	MAG	HEX FF	x	x	na

IF MAGAZINE FOUND FLAG (MFFG) IS SET THEN THE BYTES ARE SENT AS SHOW IN CASE 1.

IF MAGAZINE FOUND FLAG (MFFG) IS NOT SET THEN THE PACKET IS REJECTED.

2.3.2 UKT 625 OPERATION (CONTINUED) :

ROWS 1 THRU 25 FOUND . NOTE THAT THE TMS 3551 PROCESSES ROWS 24 AND 25 AS DISPLAY ROWS.

IF THE MAGAZINE FOUND FLAG IS NOT SET THEN THE PACKET IS REJECTED.

IF THE PAGE FOUND FLAG IS NOT SET THEN THE PACKET IS REJECTED.

IF THE MAGAZINE FOUND FLAG AND THE PAGE FOUND FLAG ARE SET THEN THE PACKET IS ACCEPTED.

BYTE	PROCESS	COMPARE/FLAG	STORE	SEND_BUF_1	BUFFER_2	BUFFER 3	HMP
1,2	INIT		x	x	x	x	na
3	FC search		x	x	x	x	na
4	HAMM_4	MAG MFFG	MAG	HEX FF	x	x	na
5	HAMM_ROW	decode row	ROW	MAG	HEX FF	x	na
6	PARITY		BYTE 6	ROW	MAG	HEX FF	A
7	PARITY		BYTE 7	BYTE 6	ROW	MAG	A
8	PARITY		BYTE 8	BYTE 7	BYTE 6	ROW	A
9 -45	PARITY		BYTE 9-45	BYTE 8 -44	BYTE 7 -43	BYTE 6-42	A
46	trailing byte.		x	BYTE 45	BYTE 44	BYTE 43	A
47	trailing byte.		x	x	BYTE 45	BYTE 44	A
48	trailing byte.		x	x	x	BYTE 45	A
49	EOP init.						na

43 TOTAL BYTES SENT TO OUTPUT DATA PORT.

BYTES 6 THRU 45 ARE ODD PARITY TESTED AND BIT 8, D7 ON THE OUTPUT DATA BUS IS ALWAYS ZERO. IF AN ERROR IS DETECTED THE CONTENTS OF THE CHAR REGISTER IS SENT.

2.3.2 UKT 625 OPERATION (CONTINUED).

ROW 26 OR 28 FOUND :

BYTE	PROCESS	COMPARE/FLAG	STORE	SEND_BUF_1	BUFFER_2	BUFFER_3	HMP
1,2	INIT		x	x	x	x	na
3	FC search		x	x	x	x	na
4	HAMM_4	MAG MFFG	MAG	HEX FF	x	x	na
5	HAMM_ROW	decode row	ROW	MAG	HEX FF	x	na
6	HAMM_4		BYTE 6	ROW	MAG	HEX FF	A
7	DIRECT		BYTE 7	BYTE 6	ROW	MAG	A
8	DIRECT		BYTE 8	BYTE 7	BYTE 6	ROW	A
9 -45	DIRECT		BYTE 9-45	BYTE 8 -44	BYTE 7 -43	BYTE 6-42	A
46	trailing byte.		x	BYTE 45	BYTE 44	BYTE 43	A
47	trailing byte.		x	x	BYTE 45	BYTE 44	A
48	trailing byte.		x	x	x	BYTE 45	A
49	EOP init.						na

43 TOTAL BYTES SENT TO OUTPUT DATA PORT.

ROW 27 FOUND :

BYTE	PROCESS	COMPARE/FLAG	STORE	SEND_BUF_1	BUFFER_2	BUFFER_3	HMP
1,2	INIT		x	x	x	x	na
3	FC search		x	x	x	x	na
4	HAMM_4	MAG MFFG	MAG	HEX FF	x	x	na
5	HAMM_ROW	decode row	ROW	MAG	HEX FF	x	na
6	HAMM_4		BYTE 6	ROW	MAG	HEX FF	A
7	HAMM_4		BYTE 7	BYTE 6	ROW	MAG	A
8	HAMM_4		BYTE 8	BYTE 7	BYTE 6	ROW	A
9-43	HAMM_4		BYTE 9-43	BYTE 8-42	BYTE 7-41	BYTE 6-40	A
44-45	DIRECT		BYTE 44-45	BYTE43 -44	BYTE 42-43	BYTE 41-42	A
46	trailing byte.		x	BYTE 45	BYTE 44	BYTE 43	A
47	trailing byte.		x	x	BYTE 45	BYTE 44	A
48	trailing byte.		x	x	x	BYTE 45	A
49	EOP init.						na

43 TOTAL BYTES SENT TO OUTPUT DATA PORT.

ROW 30, MAG=8 FOUND :

BYTE	PROCESS	COMPARE/FLAG	STORE	SEND_BUF_1	BUFFER_2	BUFFER_3	HMP
1,2	INIT		x	x	x	x	na
3	FC search		x	x	x	x	na
4	HAMM_4	MAG MFFG	MAG	HEX FF	x	x	na
	Row 30 sent ONLY IF MAGAZINE = 8						
5	HAMM_ROW	decode row	ROW	MAG	HEX FF	x	na
6	HAMM_4		BYTE 6	ROW	MAG	HEX FF	A
7	HAMM_4		BYTE 7	BYTE 6	ROW	MAG	A
8	HAMM_4		BYTE 8	BYTE 7	BYTE 6	ROW	A
9-12	HAMM_4		BYTE 9-12	BYTE 8-11	BYTE 7-10	BYTE 6-9	A
13-45	DIRECT		BYTE 13-45	BYTE12 -44	BYTE 11-43	BYTE 10-42	A
46	trailing byte.		x	BYTE 45	BYTE 44	BYTE 43	A
47	trailing byte.		x	x	BYTE 45	BYTE 44	A
48	trailing byte.		x	x	x	BYTE 45	A
49	EOP init.						na

43 TOTAL BYTES SENT TO OUTPUT DATA PORT.

2.3.3 UKT 525 OPERATION :

ROW 0 FOUND.

CASE 1 - ROW 0 FOUND : SEND ALL 0 ROWS MODE SELECTED.

BYTE	PROCESS	COMPARE/FLAG	STORE	SEND_BUF_1	BUFFER_2	BUFFER_3	HMP
1,2	INIT		x	x	x	x	na
3	FC search		x	x	x	x	na
4	HAMM_4	MAG MFFG	MAG	HEX FF	x	x	na
5	HAMM_ROW	decode row	ROW	MAG	HEX FF	x	na
6	HAMM_4	PAGEunits	PAGE u	ROW	MAG	HEX FF	A
7	HAMM_4	PAGtens PFFG	PAGE t	PAGE u	ROW	MAG	A
8	HAMM_4		BYTE 8	PAGE t	PAGEu	ROW	A
9	HAMM_4		BYTE 9	BYTE 8	PAGEt	PAGEu	A
10	HAMM_4		BYTE 10	BYTE 9	BYTE 8	PAGEt	A
11-13	HAMM_4		BYTE 11-13	BYTE 10-12	BYTE 9-11	BYTE 8-10	A
14-37	PARITY		BYTE 14-37	BYTE 13-36	BYTE 12-35	BYTE 11-34	A
38	trailing byte.		x	BYTE 37	BYTE 36	BYTE 35	A
39	trailing byte.		x	x	BYTE 37	BYTE 36	A
40	trailing byte.		x	x	x	BYTE 37	A
41	EOP init.						na

35 TOTAL BYTES SENT TO OUTPUT DATA PORT.

CASE 2 - ROW 0 FOUND : SEND ALL 0 ROWS MODE SELECTED TO ONLY SEND ROW ZERO'S CORRESPONDING TO THE MAGAZINE SELECTED.
SEND BYTES ONLY IF MAGAZINE FOUND FLAG IS SET.

BYTE	PROCESS	COMPARE/FLAG	STORE	SEND_BUF_1	BUFFER_2	BUFFER_3	HMP
1,2	INIT		x	x	x	x	na
3	FC search		x	x	x	x	na
4	HAMM_4	MAG MFFG	MAG	HEX FF	x	x	na

IF MAGAZINE FOUND FLAG (MFFG) IS SET THEN THE BYTES ARE SENT AS SHOW IN CASE 1.

IF MAGAZINE FOUND FLAG (MFFG) IS NOT SET THEN THE PACKET IS REJECTED.

UKT 525 MAG BYTE IS COMPARED ON b2 AND b4 OF BYTE 4.

2.3.3 UKT 525 OPERATION (CONTINUED).

ROWS 1 THRU 25 FOUND . NOTE THAT THE TMS 3551 PROCESSES ROWS 24 AND 25 AS DISPLAY ROWS.

IF THE MAGAZINE FOUND FLAG IS NOT SET THEN THE PACKET IS REJECTED.

IF THE PAGE FOUND FLAG IS NOT SET THEN THE PACKET IS REJECTED.

IF THE MAGAZINE FOUND FLAG AND THE PAGE FOUND FLAG ARE SET THEN THE PACKET IS ACCEPTED.

BYTE	PROCESS	COMPARE/FLAG	STORE	SEND_BUF 1	BUFFER_2	BUFFER_3	HMP
1,2	INIT		x	x	x	x	na
3	FC search		x	x	x	x	na
4	HAMM_4	MAG MFFG	MAG	HEX FF	x	x	na
5	HAMM_ROW	decode row	ROW	MAG	HEX FF	x	na
6	PARITY		BYTE 6	ROW	MAG	HEX FF	A
7	PARITY		BYTE 7	BYTE 6	ROW	MAG	A
8	PARITY		BYTE 8	BYTE 7	BYTE 6	ROW	A
9 -37	PARITY		BYTE 9-37	BYTE 8 -36	BYTE 7 -35	BYTE 6-34	A
38	trailing byte.		x	BYTE 37	BYTE 36	BYTE 35	A
39	trailing byte.		x	x	BYTE 37	BYTE 36	A
40	trailing byte.		x	x	x	BYTE 37	A
41	EOP init.						na

35 TOTAL BYTES SENT TO OUTPUT DATA PORT.

BYTES 6 THRU 37 ARE ODD PARITY TESTED AND BIT 8, D7 ON THE OUTPUT DATA BUS IS ALWAYS ZERO. IF AN ERROR IS DETECTED THE CONTENTS OF THE CHAR REGISTER IS SENT.

2.3.3 UKT 525 OPERATION (CONTINUED).

ROW 26 OR ROW 28 FOUND :

BYTE	PROCESS	COMPARE/FLAG	STORE	SEND_BUF 1	BUFFER_2	BUFFER 3	HMP
1,2	INIT		x	x	x	x	na
3	FC search		x	x	x	x	na
4	HAMM_4	MAG MFFG	BYTE	HEX FF	x	x	na
5	HAMM_ROW	decode row	ROW	MAG	HEX FF	x	na
6	HAMM_4		BYTE 6	ROW	MAG	HEX FF	A
7	DIRECT		BYTE 7	BYTE 6	ROW	MAG	A
8	DIRECT		BYTE 8	BYTE 7	BYTE 6	ROW	A
9 -37	DIRECT		BYTE 9-37	BYTE 8 -36	BYTE 7 -35	BYTE 6-34	A
38	trailing byte.		x	BYTE 37	BYTE 36	BYTE 35	A
39	trailing byte.		x	x	BYTE 37	BYTE 36	A
40	trailing byte.		x	x	x	BYTE 37	A
41	EOP init.						na

35 TOTAL BYTES SENT TO OUTPUT DATA PORT.

ROW 27, T=0 FOUND :

BYTE	PROCESS	COMPARE/FLAG	STORE	SEND_BUF_1	BUFFER_2	BUFFER_3	HMP
1,2	INIT		x	x	x	x	na
3	FC search		x	x	x	x	na
4	HAMM_4	MAG MFFG	MAG	HEX FF	x	x	na
5	HAMM_ROW	decode row	ROW	MAG	HEX FF	x	na
6	HAMM_4	designation	BYTE 6	ROW	MAG	HEX FF	A
7	HAMM_4		BYTE 7	BYTE 6	ROW	MAG	A
8	HAMM_4		BYTE 8	BYTE 7	BYTE 6	ROW	A
9-37	HAMM_4		BYTE 9-37	BYTE 8-36	BYTE 7-35	BYTE 6-34	A
38	trailing byte.		x	BYTE 37	BYTE 36	BYTE 35	A
39	trailing byte.		x	x	BYTE 37	BYTE 36	A
40	trailing byte.		x	x	x	BYTE 37	A
41	EOP init.						na

35 TOTAL BYTES SENT TO OUTPUT DATA PORT.

ROW 27, T=1 FOUND :

BYTE	PROCESS	COMPARE/FLAG	STORE	SEND_BUF_1	BUFFER_2	BUFFER 3	HMP
1,2	INIT		x	x	x	x	na
3	FC search		x	x	x	x	na
4	HAMM_4	MAG MFFG	MAG	HEX FF	x	x	na
5	HAMM_ROW	decode row	ROW	MAG	HEX FF	x	na
6	HAMM_4		BYTE 6	ROW	MAG	HEX FF	A
7	DIRECT		BYTE 7	BYTE 6	ROW	MAG	A
8	DIRECT		BYTE 8	BYTE 7	BYTE 6	ROW	A
9-12	DIRECT		BYTE 9-12	BYTE 8-11	BYTE 7-10	BYTE 6-9	A
13-37	DIRECT		BYTE 13-37	BYTE12 -36	BYTE 11-35	BYTE 10-34	A
38	trailing byte.		x	BYTE 37	BYTE 36	BYTE 35	A
39	trailing byte.		x	x	BYTE 37	BYTE 36	A
40	trailing byte.		x	x	x	BYTE 37	A
41	EOP init.						na

35 TOTAL BYTES SENT TO OUTPUT DATA PORT.

ROW 30/MAG=4/T=1 FOUND :

BYTE	PROCESS	COMPARE/FLAG	STORE	SEND_BUF_1	BUFFER_2	BUFFER_3	HMP
1,2	INIT		x	x	x	x	na
3	FC search		x	x	x	x	na
4	HAMM_4	MAG MFFG	MAG	HEX FF	x	x	na
5	HAMM_ROW	decode row	ROW	MAG	HEX FF	x	na
6	HAMM_4		BYTE 6	ROW	MAG	HEX FF	A
7	HAMM_4		BYTE 7	BYTE 6	ROW	MAG	A
8	HAMM_4		BYTE 8	BYTE 7	BYTE 6	ROW	A
9-12	HAMM_4		BYTE 9-12	BYTE 8-11	BYTE 7-10	BYTE 6-9	A
13-37	DIRECT		BYTE 13-37	BYTE12 -36	BYTE 11-35	BYTE 10-34	A
38	trailing byte.		x	BYTE 37	BYTE 36	BYTE 35	A
39	trailing byte.		x	x	BYTE 37	BYTE 36	A
40	trailing byte.		x	x	x	BYTE 37	A
41	EOP init.						na

35 TOTAL BYTES SENT TO OUTPUT DATA PORT.

2.4 TMS 3551 OPERATION IN CRC DIRECT MODE.

ROW 0 FOUND.

CASE 1 - ROW 0 FOUND : SEND ALL 0 ROWS MODE SELECTED.

BYTE	PROCESS	COMPARE/FLAG	STORE	SEND_BUF_1	BUFFER_2	BUFFER_3	HMP
1,2	INIT		x	x	x	x	na
3	FC search		x	x	x	x	na
4	HAMM_4	MAG MFFG	MAG	HEX FF	x	x	na
5	HAMM_ROW	decode row	ROW	MAG	HEX FF	x	na
6	HAMM_4	PAGEunits	PAGE u	ROW	MAG	HEX FF	A
7	HAMM_4	PAGtens PFFG	PAGE t	PAGE u	ROW	MAG	A
8	HAMM_4		BYTE 8	PAGE t	PAGEu	ROW	A
9	HAMM_4		BYTE 9	BYTE 8	PAGEt	PAGEu	A
10	HAMM_4		BYTE 10	BYTE 9	BYTE 8	PAGEt	A
11-13	HAMM_4		BYTE 11-13	BYTE 10-12	BYTE 9-11	BYTE 8-10	A
UKT 625							
14-45	DIRECT		BYTE 14-45	BYTE 13-44	BYTE 12-43	BYTE 11-42	A
46	trailing byte.		x	BYTE 45	BYTE 44	BYTE 43	A
47	trailing byte.		x	x	BYTE 45	BYTE 44	A
48	trailing byte.		x	x	x	BYTE 45	A
49	EOP init.						na

43 TOTAL BYTES SENT TO OUTPUT DATA PORT.

UKT 525							
14-37	DIRECT		BYTE 14-37	BYTE 13-36	BYTE 12-35	BYTE 11-34	A
38	trailing byte.		x	BYTE 37	BYTE 36	BYTE 35	A
39	trailing byte.		x	x	BYTE 37	BYTE 36	A
40	trailing byte.		x	x	x	BYTE 37	A
41	EOP init.						na

35 TOTAL BYTES SENT TO OUTPUT DATA PORT.

CASE 2 - ROW 0 FOUND : SEND ALL 0 ROWS MODE SELECTED TO ONLY SEND ROW ZERO'S CORRESPONDING TO THE MAGAZINE SELECTED.
SEND BYTES ONLY IF MAGAZINE FOUND FLAG IS SET.

BYTE	PROCESS	COMPARE/FLAG	STORE	SEND_BUF_1	BUFFER_2	BUFFER_3	HMP
1,2	INIT		x	x	x	x	na
3	FC search		x	x	x	x	na
4	HAMM_4	MAG MFFG	MAG	HEX FF	x	x	na

IF MAGAZINE FOUND FLAG (MFFG) IS SET THEN THE BYTES ARE SENT AS SHOW IN CASE 1. IF MAGAZINE FOUND FLAG (MFFG) IS NOT SET THEN THE PACKET IS REJECTED.

2.4 TMS 3551 OPERATION IN CRC DIRECT MODE (CONTINUED).

ROWS 1 THRU 25 FOUND . NOTE THAT THE TMS 3551 PROCESSES ROWS 24 AND 25 AS DISPLAY ROWS.

IF THE MAGAZINE FOUND FLAG IS NOT SET THEN THE PACKET IS REJECTED.

IF THE PAGE FOUND FLAG IS NOT SET THEN THE PACKET IS REJECTED.

IF THE MAGAZINE FOUND FLAG AND THE PAGE FOUND FLAG ARE SET THEN THE PACKET IS ACCEPTED.

BYTE	PROCESS	COMPARE/FLAG	STORE	SEND_BUF_1	BUFFER_2	BUFFER_3	HMP
1,2	INIT		x	x	x	x	na
3	FC search		x	x	x	x	na
4	HAMM_4	MAG MFFG	MAG	HEX FF	x	x	na
5	HAMM_ROW	decode row	ROW	MAG	HEX FF	x	na
6	DIRECT		BYTE 6	ROW	MAG	HEX FF	A
7	DIRECT		BYTE 7	BYTE 6	ROW	MAG	A
8	DIRECT		BYTE 8	BYTE 7	BYTE 6	ROW	A
UKT 625							
9 -45	DIRECT		BYTE 9-45	BYTE 8 -44	BYTE 7 -43	BYTE 6-42	A
46	trailing byte.		x	BYTE 45	BYTE 44	BYTE 43	A
47	trailing byte.		x	x	BYTE 45	BYTE 44	A
48	trailing byte.		x	x	x	BYTE 45	A
49	EOP init.						na

43 TOTAL BYTES SENT TO OUTPUT DATA PORT.

UKT 525							
9 -37	DIRECT		BYTE 9-37	BYTE 8 -36	BYTE 7 -35	BYTE 6-34	A
38	trailing byte.		x	BYTE 37	BYTE 36	BYTE 35	A
39	trailing byte.		x	x	BYTE 37	BYTE 36	A
40	trailing byte.		x	x	x	BYTE 37	A
41	EOP init.						na

35 TOTAL BYTES SENT TO OUTPUT DATA PORT.

ROWS 26 to 31 FOUND SAME AS FULL PROCESS MODE.

2.5 TMS 3551 OPERATION IN DIRECT MODE

IF THE FRAMING CODE IS DETECTED, THE PACKET IS SENT TO THE OUTPUT DATA PORT UNCHANGED.

BYTE	PROCESS	COMPARE/FLAG	STORE	SEND_BUF_1	BUFFER_2	BUFFER_3	HMP
1,2	INIT		x	x	x	x	na
3	FC search		x	x	x	x	na
4	DIRECT		BYTE 4	HEX FF	x	x	na
5	DIRECT		BYTE 5	BYTE 4	HEX FF	x	na
6	DIRECT		BYTE 6	BYTE 5	BYTE 4	HEX FF	A
7	DIRECT		BYTE 7	BYTE 6	BYTE 5	BYTE 4	
8	DIRECT		BYTE 8	BYTE 7	BYTE 6	BYTE 5	A
UKT 625							
9 -45	DIRECT		BYTE 9-45	BYTE 8 -44	BYTE 7 -43	BYTE 6-42	A
46	trailing byte.		x	BYTE 45	BYTE 44	BYTE 43	A
47	trailing byte.		x	x	BYTE 45	BYTE 44	A
48	trailing byte.		x	x	x	BYTE 45	A
49	EOP init.						na

43 TOTAL BYTES SENT TO OUTPUT DATA PORT.

UKT 525							
9 -37	DIRECT		BYTE 9-37	BYTE 8 -36	BYTE 7 -35	BYTE 6-34	A
38	trailing byte.		x	BYTE 37	BYTE 36	BYTE 35	A
39	trailing byte.		x	x	BYTE 37	BYTE 36	A
40	trailing byte.		x	x	x	BYTE 37	A
41	EOP init.						na

35 TOTAL BYTES SENT TO OUTPUT DATA PORT.

3 - FUNCTIONAL DESCRIPTION

3.1 VIDEO INPUTS PROCESSING LOGIC.

THE SN 96533 TELETEXT DATA SLICER CAN SUPPLY 5 SIGNALS.

	NOMENCLATURE	
	SN 96533	TMS 3551
1- TV LINE SYNCHRONIZATION EXTRACTION.	SLV	TVLS
2- PACKET SERIAL CLOCK.	HD	SCLK
3- PACKET SERIAL DATA INPUT STREAM.	DS	SDIN
4- FRAMING CODE SEARCH WINDOW INPUT.	RP	FCSW
5- TV COMPOSITE SYNCHRONIZATION EXTRACTION.	SC	CSYNC

TVLS IS NORMALLY HIGH AND WHEN PULSED LOW IT INDICATES THE START OF A NEW TV LINE WHERE A NEW PACKET MAY BE TRANSMITTED. TVLS IS STABLE DURING PICTURE TRANSMISSION (WHEN PACKET INFORMATION IS NOT BEING SENT).

SCLK IS THE EXTRACTED SERIAL DATA CLOCK AND IS THE MAIN CLOCK INPUT FOR THE TMS 3551. THIS CLOCK BECOMES STABLE DURING CLOCK RUN-IN AND BEFORE THE FRAMING CODE VALUE IS RECEIVED. THIS CLOCK MUST BE PRESENT FOR AT LEAST 4 BYTE TIMES AFTER THE PACKET SERIAL DATA STREAM HAS CESSED TO BE TRANSMITTED. THE SCLK SIGNAL MAY BE IN ANY STATE OR LEVEL WHILE PACKET INFORMATION IS NOT BEING SENT.

SDIN IS THE INCOMING SERIAL DIGITAL DATA STREAM (LSB FIRST) WHICH CONTAINS THE FRAMING CODE VALUE AND OTHER INFORMATION. THE FIRST STAGE OF THE TMS3551 IS A D-FLIP/FLOP WHICH SAMPLES THE SERIAL DATA STREAM ON THE FALLING EDGE OF SCLK. THE D-FLIP/FLOP IS FOLLOWED BY AN 8 BIT SERIAL IN/PARALLEL OUT SHIFT REGISTER. THE SDIN SIGNAL MAY BE IN ANY STATE OR LEVEL WHILE PACKET INFORMATION IS NOT BEING SENT.

FCSW IS THE FRAMING CODE SEARCH WINDOW. FCSW SIGNAL GOES HIGH (ACTIVE DURING THE CLOCK RUN-IN SEQUENCE AND WILL GO LOW SOMETIME DURING THE FIRST BYTE AFTER THE FRAMING CODE BYTE. THE TMS 3551 WILL LOOK FOR THE FRAMING CODE BYTE ONLY WHILE THE FCSW SIGNAL IS VALID. THE FCSW SIGNAL IS NORMALLY LOW WHILE PACKET INFORMATION IS NOT BEING SENT.

CSYNC IS THE TV COMPOSITE SYNCHRONIZATION SIGNAL AND IS USED TO DETECT THE TV VERTICLE SYNCHRONIZATION SIGNAL AND GENERATE A VBI WINDOW.

3.1 VIDEO INPUTS PROCESSING LOGIC (continued).

AT THE BEGINNING OF EACH NEW TV LINE THE TMS 3551 IS INITIALIZED TO START PROCESSING A NEW PACKET.

AS SCLK PULSES ARE RECEIVED THE TMS 3551 STARTS CLOCKING THE SERIAL DATA FROM INPUT SDIN TO THE SERIAL IN/PARALLEL OUT SHIFT REGISTER.

DURING THE CLOCK RUN-IN THE FRAMING CODE SEARCH WINDOW(FCSW) WILL GO HIGH AND THE TMS 3551 CAN THEN START LOOKING FOR A FRAMING CODE MATCH BY COMPARING THE SERIAL IN/PARALLEL OUT REGISTER CONTENTS TO THE FRAMING CODE VALUE REGISTER (FCVR) CONTENTS.

THE FRAMING CODE VALUE TO BE DETECTED IS SELECTED BY PROGRAMING THE FRAMING CODE VALUE REGISTER (FCVR) WHEN INITIALIZING THE SYSTEM.

WHEN THE FRAMING CODE IS FOUND, THE SIGNAL FRAMING CODE FOUND IS SET HIGH, AND THE "BIT COUNTER" AND THE "BYTE COUNTER" BECOME ACTIVE.

IF NO FRAMING CODE MATCH IS FOUND AFTER FCSW INPUT HAS GONE FROM HIGH TO LOW THE TMS 3551 WILL WAIT FOR THE NEXT FCSW HIGH PULSE TO RE-START THE FRAMING CODE SEARCH SEQUENCE.

3.2 CLOCK/COUNTER LOGIC.

AS THE NEW CLOCK PULSES ARRIVE ON THE SCLK INPUT, THE 3 STAGE BIT COUNTER WILL BE INCREMENTED. WHEN THE EIGHT BIT OF THE NEW BYTE ARRIVES THE BIT COUNTER INCREMENTS THE SIX (6) STAGE BYTE COUNTER.

THE NEW BYTE IS AT THIS TIME LOADED INTO THE NEW BYTE BUFFER REGISTER.

THE BYTE COUNTER WILL INDICATE THE TELETEXT STANDARD BYTE NUMBER THAT IS TO BE PROCESSED.

EXAMPLE : UKT 625 STANDARD.

TELETEXT STANDARD BYTE NUMBER	BYTE COUNTER	FUNCTION
TVLS	X-->0	LINE SYNC -->INIT.
1	0	CLOCK RUN-IN
2	0	CLOCK RUN-IN
3	0	FRAMING CODE
4	1	MAGAZINE
5	2	ROW.
N	N-3	BYTE N.

3.3 BYTE PROCESSING LOGIC.

EACH TIME THE BYTE COUNTER IS INCREMENTED A NEW BYTE IS LOADED INTO THE "NEW BYTE BUFFER REGISTER".

THE NEW BYTE BUFFER REGISTER'S OUTPUT IS SENT TO.

- HAMMING ERROR DETECTION/CORRECTION LOGIC
- ROW/BIT RE-POSITIONING LOGIC.
- PARITY ERROR DETECTION/INDICATION LOGIC.
- DIRECT PROCESS. BYTE IS UNCHANGED.

ANY ONE OF THE ABOVE FUNCTIONS' OUTPUTS CAN BE SELECTED BY THE CONTROL LOGIC AND SENT TO THE BYTE PROCESSED BUS (BPB).

THE BYTE PROCESSED BUS IS CONNECTED TO THE:

- MAGAZINE/PAGE COMPARE LOGIC.
- BYTE STORE LOGIC
- ROW STORE/DECODE LOGIC.

3.4 COMPARE/FLAG LOGIC.

THE CONTROL LOGIC CAN SELECT THE BYTE PROCESSED BUS DATA TO BE COMPARED TO :

- MAGAZINE X VALUE
- PAGE UNIT VALUE
- PAGE TENS VALUE
- NO COMPARISON

WHEN A COMPARISON IS MADE THE APPROPRIATE FLAGS ARE CONDITIONED.

MFFG - MAGAZINE FOUND FLAG

FLAG ACTIVE (SET): THE MAGAZINE COMPARISON IS EQUAL AND NOT MORE THAN ONE HAMMING ERROR IS DETECTED.

FLAG INACTIVE (CLEAR): THE MAGAZINE COMPARISON IS NOT EQUAL OR MORE THAN ONE HAMMING ERROR IS DETECTED. THE FLAG IS ALSO CLEARED ON RESET AND INIT.

NOTE :: IF THE MOST SIGNIFICANT BIT IN THE 4 BIT MAGX CONTROL REGISTER IS SET THEN THE MAGAZINE FOUND FLAG IS ALWAYS INACTIVE (CLEARED). WRITING HEX 8 TO HEX F INTO THE MAGX CONTROL REGISTER WILL SET THE MSB OF THIS REGISTER.

PFFG - PAGE FOUND FLAG

FLAG ACTIVE (SET): PAGE units AND PAGE tens COMPARISONS ARE EQUAL. THE PAGE COMPARISON IS ONLY MADE WHEN ROW ZERO IS DETECTED, THE MAGAZINE FOUND FLAG IS ACTIVE AND NOT MORE THAN ONE HAMMING ERROR IS DETECTED.

FLAG INACTIVE (CLEAR): THE PAGE COMPARISON IS MADE AND NOT EQUAL OR MORE THAN ONE HAMMING ERROR IS DETECTED.
THE FLAG IS ALSO CLEARED EVERY TIME THE PROGAMMABLE PAGE units OR PAGE tens REGISTERS ARE WRITTEN INTO.

3.5 STORE LOGIC.

THE PROCESSED DATA BUS CAN BE STORED IN ONE OF THE STORAGE REGISTERS SELECTED BY THE CONTROL LOGIC.

- BYTE STORE.
- ROW STORE.

ONE OF THE STORE REGISTERS' OUTPUTS CAN BE SELECTED BY THE CONTROL LOGIC TO BE SENT TO THE OUTPUT PORT BUFFER 1.

3.6 SEND/OUTPUT DATA BUFFER LOGIC.

ONE OF THE STORE REGISTERS' OUTPUTS CAN BE SELECTED BY THE CONTROL LOGIC TO BE SENT TO OUTPUT PORT BUFFER 1.

OUTPUT PORT BUFFER 1 IS FOLLOWED BY OUTPUT PORT BUFFER 2 AND 3. OUTPUT PORT BUFFER 3 IS CONNECTED TO THE OUTPUT DATA BUS, D0 THRU D7, VIA THE OUTPUT BUS ENABLE LOGIC.

OUTPUT PORT BUFFERS 1, 2 AND 3 HAVE ASSOCIATED 1 BIT ENABLE REGISTERS. WHEN THE BUFFER 3 ENABLE REGISTER IS SET, IT WILL VALIDATE THE HMP CLOCK THEREBY INDICATING THAT OUTPUT PORT BUFFER 3 IS READY TO SEND DATA TO THE OUTPUT DATA BUS. THE RECEIVING CIRCUITRY WHEN SENSING HMP CLOCK CAN ENABLE THE OUTPUT DATA BUS BY SETTING HIZ INPUT AND CAS INPUT LOW.

3.7 CONTROL LOGIC.

THE CONTROL LOGIC OUTPUTS WILL BE DETERMINED BY THE;

- MODE REGISTER
- STANDARD SELECTED.
- BYTE NUMBER/BYTE COUNTER
- ROW NUMBER

CONTROL LINES

PROC				SEND		STORE	
hr	H	P	D	r	b	b	r
H	H	P	D	0	0 lead	B	R
R	4	A	I	0	1 byte	Y	O
O		R	R	1	0 row	T	W
W		I	E	1	1 lead	E	
		t	C				
		Y	T				

COMP			ENABLE B1
m	u	t	en
M	P	P	B
A	A	A	U
G	G	G	F
X	U	T	1

^
+— enable buffer 1

UKT OPERATION FULL PROCESS MODE.

UKT BYTE	byte COUNT.	STAD	ROW	OPerat.	CONTROL LINES process hr	H	P	D	send r	b	str b	r	comp m	u	t	en
49	>=46	UK625	x	EOP	0	1	0	0	0	0	1	0	0	0	0	0
41	>=38	UK525	x	EOP	0	1	0	0	0	0	1	0	0	0	0	0
-	0	UKT	x	reset	0	1	0	0	0	0	1	0	0	0	0	0
1,2	0	UKT	x	clk.r-in	0	1	0	0	0	0	1	0	0	0	0	0
3	0	UKT	x	framing	0	1	0	0	0	0	1	0	0	0	0	0
4	1	UKT	x	MAG test	0	1	0	0	0	0	1	0	1	0	0	1
5	2	UKT	0-31	ROW test	1	0	0	0	0	1	0	1	0	0	0	1

3.7 CONTROL LOGIC (CONTINUED).

UKT OPERATION FULL PROCESS MODE ROW 0 FOUND.

UKT BYTE	byte COUNT.	STAD	ROW	OPerat.	CONTROL LINES ! process hr H P D	!send r b	!str b r	comp m u t	!en en
6	3	UKT	0	PAGu test	0 1 0 0	1 0	1 0	0 1 0	1
7	4	UKT	0	PAGt test	0 1 0 0	0 1	1 0	0 0 1	1
8-13	5-10	UKT	0	HAM byte	0 1 0 0	0 1	1 0	0 0 0	1
14-48	11-45	UK625	0	PAR byte	0 0 1 0	0 1	1 0	0 0 0	1
14-40	11-37	UK525	0	PAR byte	0 0 1 0	0 1	1 0	0 0 0	1

UKT OPERATION FULL PROCESS MODE ROW 1-25 FOUND :

UKT BYTE	byte COUNT.	STAD	ROW	OPerat.	! process hr H P D	!send r b	!str b r	comp m u t	!en en
6	3	UKT	1-25	PAR byte	0 0 1 0	1 0	1 0	0 0 0	1
7-48	4-45	UK625	1-25	PAR byte	0 0 1 0	0 1	1 0	0 0 0	1
7-40	4-37	UK525	1-25	PAR byte	0 0 1 0	0 1	1 0	0 0 0	1

UKT OPERATION FULL PROCESS MODE ROW 26 OR 28 FOUND (UKT 525).

UKT BYTE	byte COUNT.	STAD	ROW	OPerat.	! process hr H P D	!send r b	!str b r	comp m u t	!en en
6	3	UKT	26 or28	HAM byte	0 1 0 0	1 0	1 0	0 0 0	1
7-48	4-45	UK625	26 or28	DIRECT	0 0 0 1	0 1	1 0	0 0 0	1
7-40	4-37	UK525	26 or28	DIRECT	0 0 0 1	0 1	1 0	0 0 0	1

UKT OPERATION FULL PROCESS MODE ROW 27 UK625

UKT BYTE	byte COUNT.	STAD	ROW	OPerat.	CONTROL LINES process hr	H	P	D	send r	b	str b	r	comp m	u	t	en
6	3	UK625	27	HAM byte	0	1	0	0	1	0	1	0	0	0	0	1
7 -43	4 -40	UK625	27	HAM byte	0	1	0	0	0	1	1	0	0	0	0	1
44-48	41-45	UK625	27	DIRECT	0	0	0	1	0	1	1	0	0	0	0	1

UKT OPERATION FULL PROCESS MODE ROW 27, UK525, TAB=0).

UKT BYTE	byte COUNT.	STAD	ROW	OPerat.	process hr	H	P	D	send r	b	str b	r	comp m	u	t	en
6	3	UK525	27	HAM byte	0	1	0	0	1	0	1	0	0	0	0	1
7-40	4-37	UK525	27	HAM byte	0	1	0	0	0	1	1	0	0	0	0	1

UKT OPERATION FULL PROCESS MODE ROW 27, UK525, TAB=1).

UKT BYTE	byte COUNT.	STAD	ROW	OPerat.	process hr	H	P	D	send r	b	str b	r	comp m	u	t	en
6	3	UK525	27	HAM byte	0	1	0	0	1	0	1	0	0	0	0	1
7 -40	4 -37	UK525	27	DIRECT	0	0	0	1	0	1	1	0	0	0	0	1

UKT OPERATION FULL PROCESS MODE ROW 30 (UK625 MAG8, UK525 MAG4/TAB1).

UKT BYTE	byte COUNT.	STAD	ROW	OPerat.		process hr	H	P	D	send r	b	str b	r	comp m	u	t	en
6	3	UKT	30	HAM byte		0	1	0	0	1	0	1	0	0	0	0	1
7-12	4-9	UKT	30	HAM byte		0	1	0	0	0	1	1	0	0	0	0	1
13-48	10-45	UK625	30	DIRECT	10	0	0	0	1	0	1	1	0	0	0	0	1
13-40	10-37	UK525	30	DIRECT	10	0	0	0	1	0	1	1	0	0	0	0	1

3.7 CONTROL LOGIC (CONTINUED).

UKT OPERATION CRC DIRECT MODE ROW 0 FOUND.

UKT BYTE	byte COUNT.	STAD	ROW	OPerat.	CONTROL LINES ! process hr H P D	! send r b	! str b r	! comp m u t	! en en
6	3	UKT	0	PAGu test	0 1 0 0	1 0	1 0	0 1 0	1
7	4	UKT	0	PAGt test	0 1 0 0	0 1	1 0	0 0 1	1
8-13	5-10	UKT	0	HAM byte	0 1 0 0	0 1	1 0	0 0 0	1
14-48	11-45	UK625	0	DIRECT	0 0 0 1	0 1	1 0	0 0 0	1
14-40	11-37	UK525	0	DIRECT	0 0 0 1	0 1	1 0	0 0 0	1

UKT OPERATION CRC DIRECT MODE ROW 1-25 FOUND :

UKT BYTE	byte COUNT.	STAD	ROW	OPerat.	! process hr H P D	! send r b	! str b r	! comp m u t	! en en
6	3	UKT	1-25	DIRECT	0 0 0 1	1 0	1 0	0 0 0	1
7-48	4-45	UK625	1-25	DIRECT	0 0 0 1	0 1	1 0	0 0 0	1
7-40	4-37	UK525	1-25	DIRECT	0 0 0 1	0 1	1 0	0 0 0	1

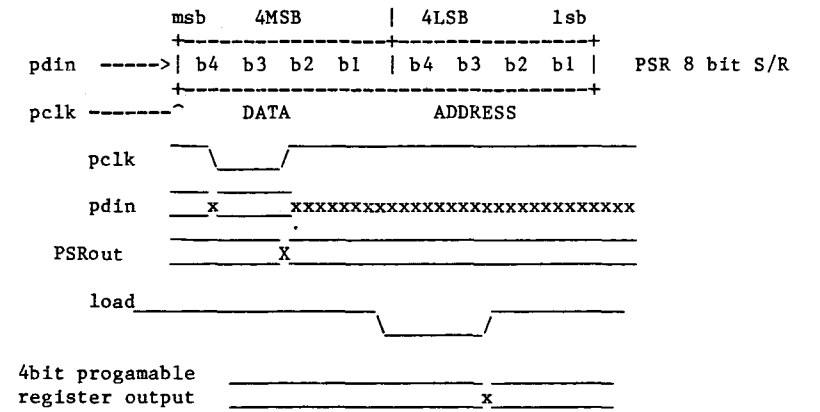
UKT OPERATION DIRECT MODE.

UKT BYTE	byte COUNT.	STAD	ROW	OPerat.	! process hr H P D	! send r b	! str b r	! comp m u t	! en en
49	>=46	UK625	x	EOP	0 0 0 1	0 0	1 0	0 0 0	0
41	>=38	UK525	x	EOP	0 0 0 1	0 0	1 0	0 0 0	0
-	0	UKT	x	reset	0 0 0 1	0 0	1 0	0 0 0	0
1,2	0	UKT	x	clk.r-in	0 0 0 1	0 0	1 0	0 0 0	0
3	0	UKT	x	framing	0 0 0 1	0 0	1 0	0 0 0	0
4	1	UKT	x	DIRECT	0 0 0 1	0 0	1 0	0 0 0	1
5-48	2-45	UK625	0	DIRECT	0 0 0 1	0 1	1 0	0 0 0	1
5-40	2-37	UK525	0	DIRECT	0 0 0 1	0 1	1 0	0 0 0	1

3.8 CONTROL REGISTERS. ADDRESSING/WRITE/READ.

BITS M-----L	HEX ADR	REG.NAME	REG.FUNCTION
4 3 2 1	1	STAD	STANDARD SELECTION REGISTER.
4 3 2 1	2	MODE	MODE SELECTION REGISTER
4 3 2 1	3	FCVR 4 LSB	FRAMMING CODE VALUE REGISTER
4 3 2 1	4	FCVR 4 MSB	FRAMMING CODE VALUE REGISTER
4 3 2 1	5	LEAD 4 LSB	LEADING BYTE VALUE REGISTER.
4 3 2 1	6	LEAD 4 MSB	LEADING BYTE VALUE REGISTER.
4 3 2 1	7	CHAR 4 LSB	PARITY ERROR CHAR FILL.
4 3 2 1	8	CHAR 4 MSB	PARITY ERROR CHAR FILL.
4 3 2 1	9	MAGX	MAGAZINE COMPARE REGISTER
4 3 2 1	A	PAGU	PAGE units COMPARE REGISTER
4 3 2 1	B	PAGT	PAGE tens COMPARE REGISTER.

THE ABOVE CONTROL REGISTERS ARE PROGRAMMED VIA THE PROGRAMMABLE DATA SERIAL INPUT (PDIN) PIN, THE PROGRAMMABLE CLOCK (PCLK) INPUT PIN, THE LOAD INPUT PIN AND THE 8 BIT SERIAL REGISTER (PSR).



EXAMPLE TO PROGRAM STANDARD REGISTER (ADR=1) TO CONTAIN 4 HEX.

1- SEND 8 CLOCK PULSES TO THE PCLK INPUT WITH THE CORRESPONDING SERIAL DATA TO THE TMS 3551 TO LOAD THE 8 BIT SERIAL REGISTER (PSR).
DATA PATTERN RECEIVED 1000 0010 (LSB SENT/RECEIVED FIRST).

	4msb data				4lsb adr.			
	msb							lsb
PSR CONTENTS	b4	b3	b2	b1	b4	b3	b2	b1
	0	1	0	0	0	0	0	1

2- SEND THE LOAD PULSE TO LOAD THE STANDARD REGISTER ADDRESSED BY THE 4LSB OF THE PSR REGISTER.

3.8 CONTROL REGISTERS. ADDRESSING/WRITE/READ (CONTINUED).

CONTROL REGISTER MAP ::

REG	HEX ADR	MSB B4	B3	B2	LSB B1
STAD	1	1 UK625 0	0 1 UK525	1 VBI (A) 0 VBI (NA)	1-3551 (NA) 0-3551 (AC)
MODE	2	1 SAZR (AC) 0 SAZR (NA)	1 FPM 0 0	0 1 CRC 0	0 0 1 DIRECT
FCVR 4LSB	3	0	1	1	1
FCVR 4MSB	4	0	0	1	0
LEAD 4LSB	5	X	X	X	X
LEAD 4MSB	6	X	X	X	X
CHAR 4LSB	7	X	X	X	X
CHAR 4MSB	8	X	X	X	X
MAGX	9	1 MFFG (NA) 0 MFFG (AC)	X	X	X
PAGU	A	X	X	X	X
PAGT	B	X	X	X	X

NA = NOT ACTIVE
AC = ACTIVE

3.9 RESET/INIT LOGIC.

WHEN RESET SIGNAL INPUT GOES LOW :
- THE HMP CLOCK OUTPUT IS DISABLED.
- THE SERIAL PARALLEL REGISTER IS CLEARED.
- ALL FLAGS (EXCEPT PAGE FOUND FLAG) ARE CLEARED.
- THE BIT AND BYTE COUNTER ARE ZEROED.

WHEN THE INTERNAL INIT SIGNAL GOES LOW :
- THE HMP CLOCK OUTPUT IS DISABLED.
- THE SERIAL PARALLEL REGISTER IS CLEARED.
- ALL FLAGS (EXCEPT PAGE FOUND FLAG) ARE CLEARED.
- THE BIT AND BYTE COUNTER ARE ZEROED.

3.10 VBI/FF SELECTION.

INTERNAL VERTICAL SYNC DETECTOR ACTIVE :
WHEN BIT 2 OF THE STANDARDS REGISTER IS SET AND EVERT PIN IS WIRED LOW THE TMS 3551 WILL OPEN A WINDOW AND PROCESS DATA RECIEVED ON THE LINES AFTER THE TV FRAME SYNCHRONISATION IS DETECTED.
THE NUBER OF LINES THAT THIS "VBI WINDOW" WILL STAY OPEN CAN BE MASKED PROGRAMMED FROM 16 LINES TO 32 LINES.

INTERNAL VERTICAL SYNC DETECTOR INACTIVE :
WHEN BIT 2 OF THE STANDARDS REGISTER IS SET AND CSYNC PIN IS WIRED LOW AN EXTERNAL VERTICLE SYNC PULSE (ACTIVE HIGH) CAN BE INPUTED TO EVERT PIN. THE TMS 3551 WILL THEN OPEN A WINDOW AND PROCESS DATA RECIEVED ON THE FIRST

LINES AFTER THE EXTERNAL VERTICLE SYNC SIGNAL GOES FROM HIGH TO LOW.
THE NUBER OF LINES THAT THIS "VBI WINDOW" WILL STAY OPEN CAN BE MASKED PROGRAMMED FROM 16 LINES TO 32 LINES.

WHEN BIT 2 OF THE STANDARDS REGISTER IS RESET ("0") THE TMS 3551 CAN PROCESS DATA RECIEVED ON ALL TV LINES (FF = FULL FIELD).

3.11 DISABLE/ENABLE PACKET PROCESSING.

WHEN BIT 1 OF THE STANDARDS REGISTER IS SET ("1") THE TMS 3551 WILL STOP PROCESSING PACKETS.
WHEN BIT 1 OF THE STANDARDS REGISTER IS RESET THE TMS 3551 CAN PROCESS PACKETS IF ALL OTHER REGISTERS ARE PROGRAMMED CORRECTLY.

3.12 AUXILARY D-FLIP FLOP.

THE AUXILARY D-FLIP FLOP INPUT FFin IS CLOCKED OUT OF THE INVERTED FFout OUTPUT ON THE NEGATIVE EDGE OF THE FFck SIGNAL.

4 - ELECTRICAL SPECIFICATIONS

4.1 ABSOLUTE MAXIMUM RATINGS

Stresses beyond those listed under "ABSOLUTE MAXIMUM RATINGS" may cause permanent damage to the device. This is a stress rating only and functional operating of the device at those or any other conditions not indicated in "RECOMMENDED OPERATING CONDITIONS" section of this specification is not implied. Exposure to absolute maximum rated conditions for extended periods may affect device reliability. Unless otherwise noted, all voltage values are with respect to VSS.

Supply Voltage, VDD	-0.3 to 7	volts	1
Supply Voltage rate of rise, dVDD/dT	0.5	volts/nSec.	
All input/output voltages	-0.3 to 7	volts	
Input diode current	+/- 20	mA	2
Output diode current	+/- 20	mA	2
Continuous output current	+/- 25	mA	3
Continuous Vdd or Vss current	+/- 25	mA	
Continuous power dissipation	0.300	watts	
Storage temperature range	-65 to 150	C	

Note 1. Larger negative voltages are permitted if the current is limited to 100 mA peak, 50 mA DC.
note 2. Rating applies to current externally forced through diode.
note 3. Rating applies to current flowing in output transistors.

4.2 RECOMMENDED OPERATING CONDITIONS

Recommended operating conditions must be met to be sure the device will function correctly. They apply over the full recommended supply voltage range and the operating free-air temperature range unless otherwise specified.

PARAMETER	symbol	MIN.	NOM.	MAX.	UNITS	Remarks
Free-air operating temperature.	Ta	0	25	+70	'C	
Supply Voltage	VDD	4.5	5.0	5.5	volts	
High level TTL input voltage	Vih	2.0		VDD	volts	TTL inputs
High level CMOS input voltage	Vih	0.7x VDD		VDD	volts	CMOS inputs
Low level TTL input voltage	Vil	VSS		0.8	volts	TTL inputs
Low level CMOS input voltage	Vil	VSS		0.3x VDD	volts	CMOS inputs
FFck	Fffck		2		MHz	Aux.flip-flop clock
FFin set-up time	tsu		50		nS	Measured at 50%
hold time	thd		50		nS	edge of SCLK

4.2 RECOMMENDED OPERATING CONDITIONS (continued).

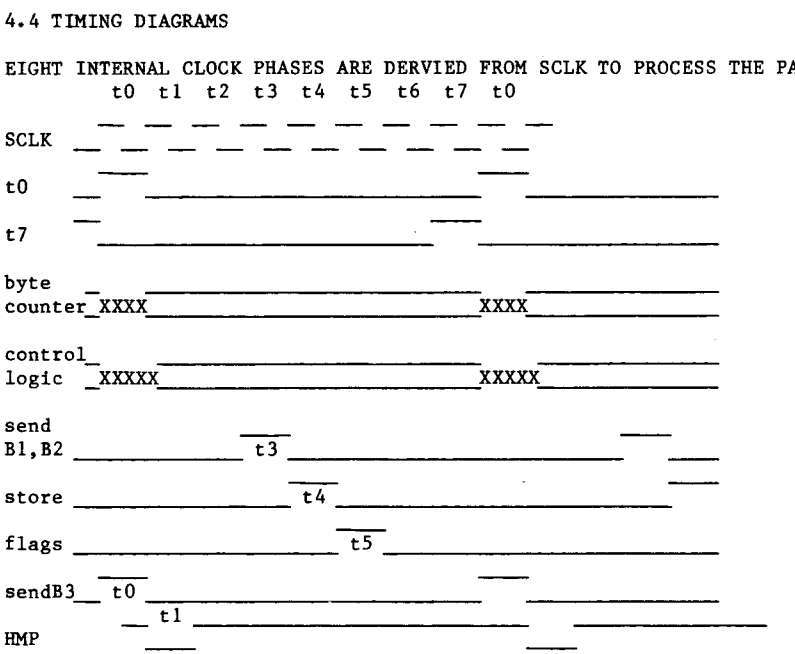
PARAMETER	symbol	MIN.	NOM.	MAX.	UNITS	Remarks
SCLK FREQUENCY	Fsclk	2		8	MHz	
SCLK PULSE WIDTH						Frequency = 8 MHz
HIGH LEVEL	PW		50		nS	
LOW LEVEL	PW		50		nS	
SCLK, SDIN, TVLS, FCSW rise time	tr		10		nS	
fall time	tf		10		nS	
SDIN set-up time	tsu		0		nS	Measured at 50%
hold time	thd		2		nS	edge of SCLK
TVLS PULSE WIDTH						
LOW LEVEL	PW	400			nS	
FCSW PULSE WIDTH						Must overlap MSB
HIGH LEVEL	PW		1.0		US	of framing code.
PCLK FREQUENCY	Fpclk		2		MHz	
PCLK PULSE WIDTH						
HIGH LEVEL	PW		200		nS	
LOW LEVEL	PW		200		nS	
PCLK, PDIN, LOAD rise time	tr		20		nS	
fall time	tf		20		nS	
LOAD PULSE WIDTH						
LOW LEVEL	PW		200		nS	
HIZ PULSE WIDTH						
LOW LEVEL	PW	200			nS	
HIZ rise time	tr		20		nS	
fall time	tf		20		nS	
CAS PULSE WIDTH						
LOW LEVEL	PW	100			nS	
CAS rise time	tr		10		nS	
fall time	tf		10		nS	

4.3 ELECTRICAL CHARACTERISTICS over recommended temperature range and recommended supply voltage range.

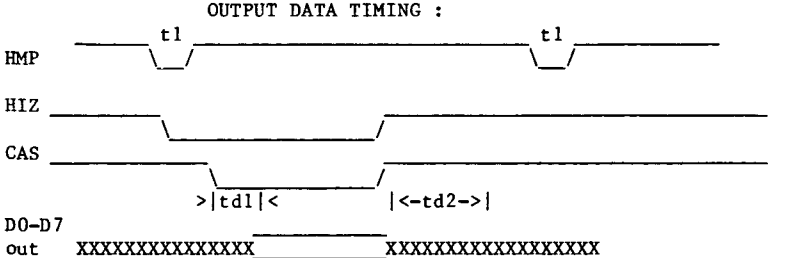
PARAMETER	symbol	Min.	Nom.	Max.	Unit	Test Conditions.
Supply Current Operating	IDD		2		mA	FREQ. = 8 mhz All outputs open
Input current	Ii		10		uA	Vi = VDD = 5V
High level output voltage	Voh	2.4		VDD	V	Ioh = 1.0 mA max.
Low level output voltage	Vol	VSS		0.4	V	Iol = 1.5 mA max. VDD =
HMP PULSE WIDTH LOW LEVEL	PW1		125		nS	1 period of SCLK. @ 8 MHZ
HMP rise time	tf		10		ns	Ioh = 1.0 ma max. Iol = 1.5 ma max.
fall time	tf		10		nS	Cload = 50 pf max.
D0 TO D7 rise time	tf		10		ns	Ioh = 1.0 ma max. Iol = 1.5 ma max.
fall time	tf		10		nS	Cload = 50 pf max.
D0 TO D7 delay time	td1			40	ns	Ioh = 1.0 ma max. Iol = 1.5 ma max. Cload = 50 pf max. Measured from falling edge of HIZ or CAS. see timing diagram.
CAS TO t0	td2	50			ns	see timing diagram.
FFout delay time	td		100		ns	Measured from falling edge (50%) of FFck.

4.4 TIMING DIAGRAMS

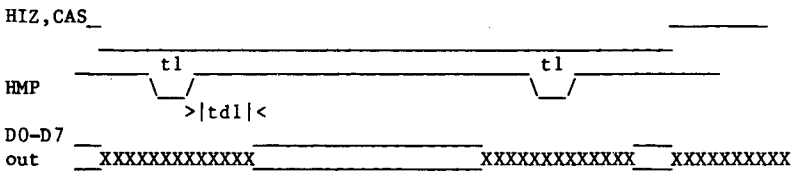
EIGHT INTERNAL CLOCK PHASES ARE DERVIED FROM SCLK TO PROCESS THE PACKET DATA



OUTPUT DATA TIMING :



OUTPUT DATA TIMING :



5 - PIN LIST 28 PINS PLASTIC

POWER INPUTS :		
2	VDD	POSITIVE VOLTAGE INPUT.
2	VSS	COMMON (GROUND, NEGATIVE) VOLTAGE INPUT.
RESET INPUT :		
1	RESET	ACTIVE LOW
VIDEO INPUTS :		
1	TVLS	TV LINE SYNCHRONIZATION SIGNAL (ACTIVE LOW).
1	CSYNC	TV COMPOSITE SYNCHRONIZATION SIGNAL, ACTIVE ON FALLING EDGE.
1	SCLK	SERIAL DATA CLOCK.
1	SDIN	SERIAL DATA INPUT STREAM.
1	FCSW	FRAMMING CODE SEARCH WINDOW INPUT (ACTIVE HIGH).
PROGRAMMING INPUTS :		
1	PDIN	PROGRAM DATA INPUT (SERIAL)
1	PCLK	PROGAM CLOCK (SERIAL). ACTIVE ON RISING EDGE.
1	LOAD	LOADS INTERNAL PROGRAMMABLE REGISTERS.
DATA CONTROL INPUTS :		
2	HIZ, CAS	WHEN HIZ AND CAS ARE LOW THE OUTPUT DATA BUS (D0-D7 IS ENABLED. WHEN EITHER HIZ OR CAS IS HIGH THE OUTPUT DATA BUS IS IN THE HIGH IMPEDANCE STATE.
DATA OUTPUTS :		
8	D0 TO D7	OUTPUT DATA BUS. (PROCESSED PACKETS)
1	HMP	WHEN ACTIVE (LOW) INDICATES THAT THE OUTPUT DATA BUFFER CONTAINS A VALID PACKET BYTE.
INPUT SIGNAL		OPENS VBI WINDOW WITH EXTERNAL PULSE.
1	EVERT.	ACTIVE HIGH.
AUXILARY D-FLIP FLOP.		
1	FFin	INPUT TO AUXILARY D-FLIP FLOP
1	FFck	CLOCK TO AUXILARY D-FLIP FLOP(negative edge trigg.)
1	FFout	INVERTED OUTPUT OF AUXILARY D-FLIP-FLOP

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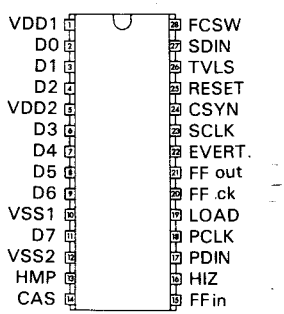
28 TOTAL

TMS 3551 TERMINAL ASSIGNMENTS

5.1 TENTATIVE PIN ASSIGNMENTS.

PIN #	TMS3551	TMS3551 function	(TMS3534)
1	VDD1	POSITIVE SUPPLY VOLTAGE	VDD
2	D0	LSB BYTE OUTPUT	SA
3	D1	BYTE OUTPUT	SB
4	D2	BYTE OUTPUT	SC
5	VDD2	Must be externally connected to VDD1(MODIFI)	TI
6	D3	BYTE OUTPUT	SD
7	D4	BYTE OUTPUT	SE
8	D5	BYTE OUTPUT	SF
9	D6	BYTE OUTPUT	SG
10	VSS1	NEGATIVE SUPPLY VOLTAGE (MODIFIED)	VSS
11	D7	MSB BYTE OUTPUT	SH
12	VSS2	Must be externally connected to VSS1	HIZ
13	HMP	DATA OUTPUT READY CLOCK	HMP
14	CAS	STROBE DATA CONTROL INPUT	nc
15	FFin	INPUT TO AUXILARY D-FLIP FLOP	CBB
16	HIZ	HIGH IMPEDANCE CONTROL INPUT (MODIFIED)	nc
17	PDIN	PROGRAM DATA INPUT	CRUOUT
18	PCLK	PROGAM CLOCK	CRUCLK
19	LOAD	LOADS INTERNAL PROGRAMMABLE REGISTERS.	CRU ENABLE
20	FFck	CLOCK TO AUXILARY D-FLIP FLOP	PTR
21	FFout	OUTPUT OF AUXILARY D-FLIP-FLOP	EN
22	EVERT.	EXTERNAL VERTICALE SYNC PULSE	7/8
23	SCLK	SERIAL DATA CLOCK.	HD
24	CSYN	TV COMPOSITE SYNC. SIGNAL EXTRACTION.	nc
25	RESET	ACTIVE LOW (MODIFIED)	nc
26	TVLS	TV LINE SYNCHRONIZATION SIGNAL.	SLV
27	SDIN	SERIAL DATA INPUT STREAM.	DS
28	FCSW	FRAMMING CODE SEARCH WINDOW INPUT.	RP



6 - ANNEXES

6.1 REFERENCES

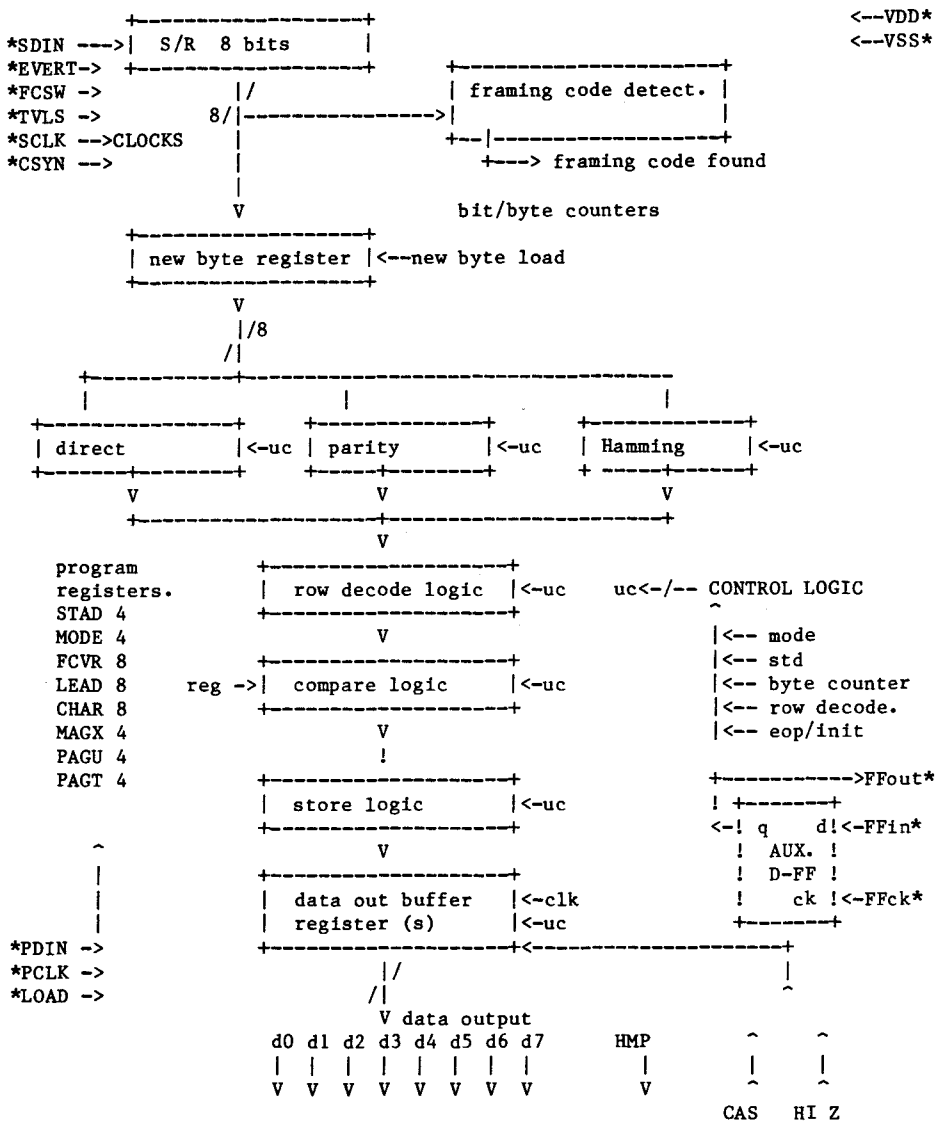
1 + BRITISH BROADCASTING CORP. & INDEPENDENT BROADCASTING AUTHORITY & BRITISH RADIO EQUIPMENT MANUFACTURERS' ASSOCIATION, BROADCAST TELETEXT SPECIFICATION, SEPTEMBER 1976.

2 + TELEDIFUSSION DE FRANCE ETABLISSEMENT PUBLIC DE L'ETAT, SYSTEME DE TELETEXTE PROCEDES DIDON (1) - ANTIOPE (1) SPECIFICATIONS TECHNIQUES POUR LA NORME L VERSION D2 A4-2, SEPTEMBRE 1981

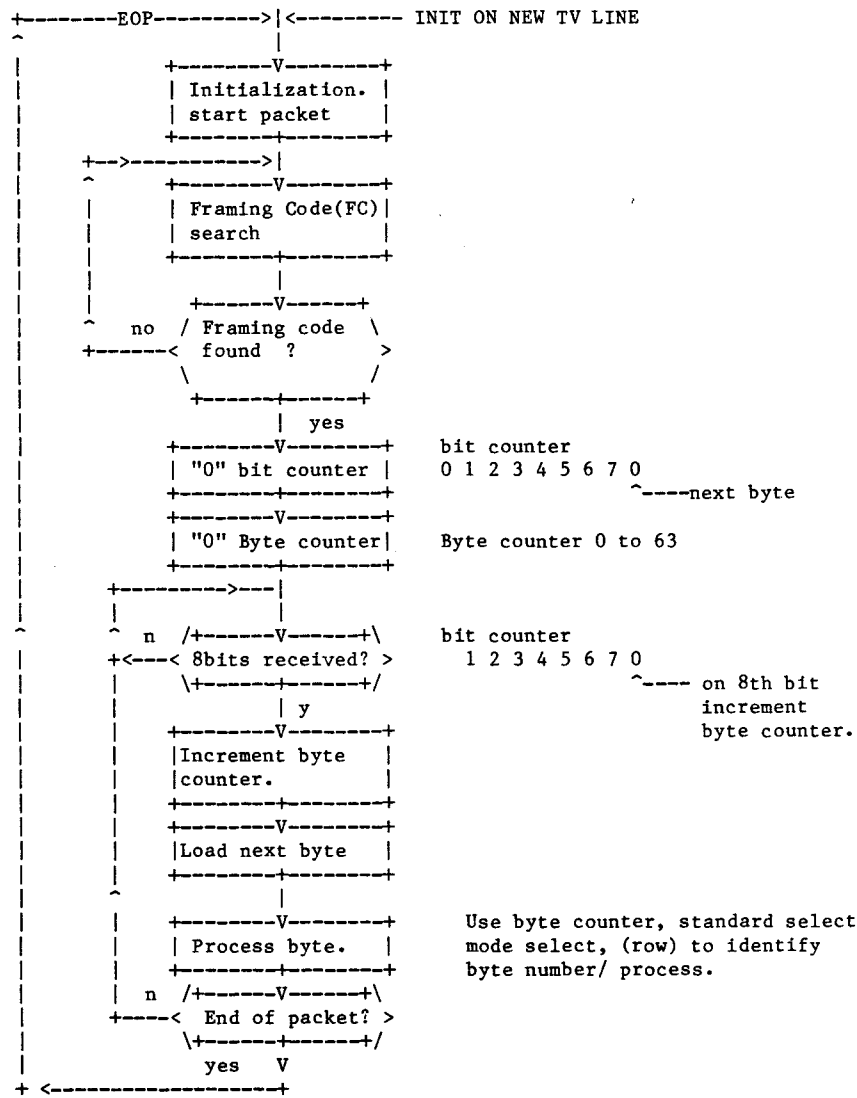
3 + TEXAS INSTRUMENTS FRANCE, APPLICATION NOTE SN 96533 TELETEXT DATA SLICER, MARCH 1983.

4 + TEXAS INSTRUMENTS FRANCE, SPECIFICATION TMS 3534 DIDON (1) PREFIX PROCESSOR, MAY 1980.

NOTES : 1 - DIDON AND ANTIOPE ARE REGISTERED TRADEMARKS OF TELEDIFUSSION DE FRANCE.


<--VDD*
<--VSS*
*SDIN --->| S/R 8 bits
*EVERT->
*FCSW ->
*TVLS ->
*SCLK -->CLOCKS
*CSYN -->
8/
framing code detect.
framing code found
bit/byte counters
new byte register
<--new byte load
/8
direct
parity
Hamming
<-uc
program registers.
STAD 4
MODE 4
FCVR 8
LEAD 8
CHAR 8
MAGX 4
PAGU 4
PAGT 4
reg ->
row decode logic
compare logic
store logic
data out buffer
register (s)
uc<-/-- CONTROL LOGIC
<-- mode
<-- std
<-- byte counter
<-- row decode.
<-- eop/init
>FFout*
<-! q d!<-FFin*
AUX. D-FF
ck !<-FFck*
<-clk
*PDIN ->
*PCLK ->
*LOAD ->
V data output
d0 d1 d2 d3 d4 d5 d6 d7
HMP
CAS
HI Z

6.3 GENERAL FLOW DIAGRAM.



6.4 PROCESS SUMMARY

FULL PROCESS MODE

ROW FOUND	PACKET ACCEPT CONDITIONS	BYTES SENT TO OUTPUT DATA PORT
ROW 0 case 1	SEND ALL ZERO ROWS.	LEAD - MAG - ROW-Pu-Pt- BYTES 8-13 BYTES >=14 h h h h hamming p/pe
case 2	MAGAZINE FOUND.	LEAD - MAG - ROW-Pu-Pt- BYTES 8-13 BYTES >=14 h h h h h p/pe
ROWS 1 to 25	MAG. and PAGE FOUND	LEAD - MAG - ROW - BYTES >=6 h h p/pe
ROWS 26 or 28	MAG. and PAGE FOUND	LEAD - MAG - ROW - BYTE 6 BYTES >= 7 h h h direct
ROW 27 UK625	MAG. and PAGE FOUND	LEAD - MAG - ROW - BYTES 6-43 BYTES 44,45 h h h direct
ROW 0/27 UK525	MAG. and PAGE FOUND	LEAD - MAG - ROW - BYTES 6-37 h h h
ROW 1/27 UK525	MAG. and PAGE FOUND	LEAD - MAG - ROW - BYTE 6 BYTES>=7 h h h direct
ROW 30	MAG "0" FOUND FOUND	LEAD - MAG - ROW - BYTES 6-12 BYTES>=13 h h h direct

NOTE : ALL PACKETS ARE REJECTED IF :

- THE FRAMING CODE IS NOT FOUND.
- MORE THAN ONE HAMMING ERROR IN THE MAGAZINE OR ROW BYTE.
- ROW 29 OR ROW 31 IS FOUND.

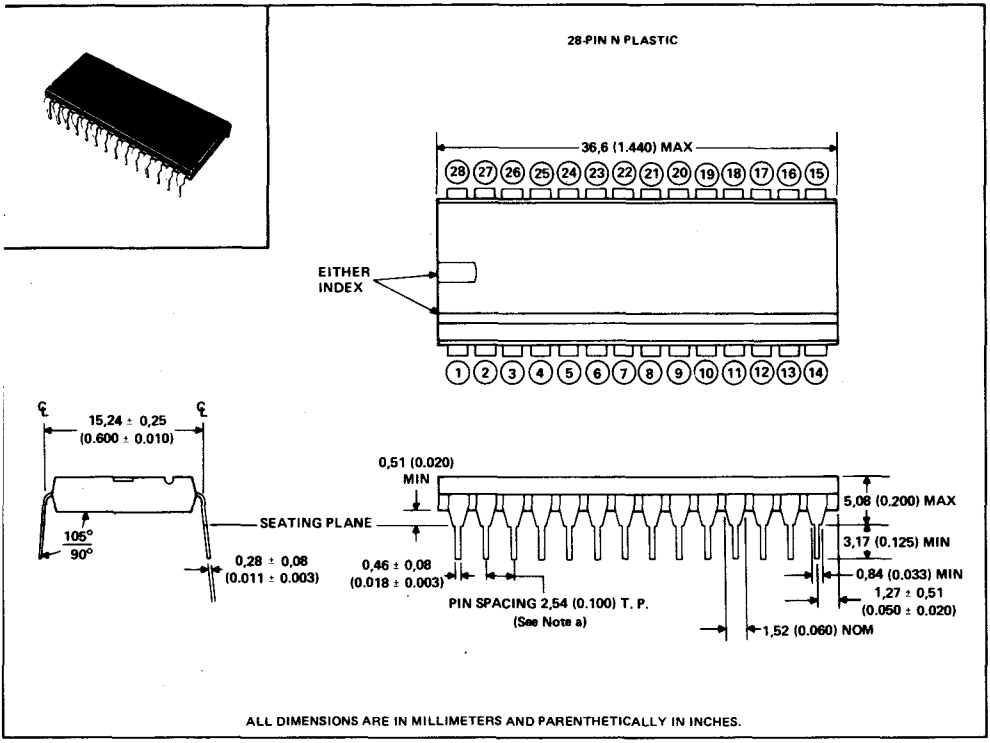
CRC DIRECT MODE :

SAME AS ABOVE EXCEPT THAT ALL CHARACTER BYTES IN ROWS 0 TO 25 ARE SENT TO THE OUTPUT DATA PORT UNCHANGED.

DIRECT MODE :

AFTER THE FRAMING CODE IS DETECTED ALL THE BYTES ARE SENT TO THE OUTPUT DATA PORT UNCHANGED PRECEDED BY THE LEAD BYTE.

MECHANICAL DATA
TMS 3551 28-PIN PLASTIC PACKAGE



NOTE: a. Each pin centerline is located within 0,25 (0.010) of its true longitudinal position.