

## RECOMMENDATION ITU-R BT.1304

**CHECKSUM FOR ERROR DETECTION AND STATUS  
INFORMATION IN INTERFACES CONFORMING WITH  
RECOMMENDATIONS ITU-R BT.656 AND ITU-R BT.799**

(Question ITU-R 65/11)

(1997)

The ITU Radiocommunication Assembly,

*considering*

- a) that many countries are installing digital television production facilities based on the use of digital video components conforming to Recommendations ITU-R BT.601 and ITU-R BT.656;
- b) that there exists the capacity within a signal conforming to Recommendation ITU-R BT.656 for additional data signals to be multiplexed with the video data signal itself;
- c) that there are operational and economic benefits to be achieved by the multiplexing of ancillary data signals with the video data signal;
- d) that the operational benefits are increased if a minimum of different formats are used for ancillary data signals;
- e) that some countries are already using ancillary data signals embedded in the video data signal,

*recommends*

- 1** that for optional error detection and provision of status information the methods described in Annex 1 for the generation of checkwords and status flags should be used in interfaces conforming with Recommendations ITU-R BT.656 and ITU-R BT.799.

## ANNEX 1

**Checksum for error detection and status information****1 Introduction**

This specification describes the generation of error detection checkwords and related status flags to be used optionally in conjunction with the serial digital interface described in Recommendation ITU-R BT.656.

Two checkwords are defined: one based on a field of active picture video data words and the other on a full field of data words. This two-word approach provides continuing error detection for the active picture when the digital signal has passed through processing equipment that has changed the data outside the active picture area without recalculating the full-field checkword.

Three sets of flags are provided to feed forward information regarding detected errors to help facilitate identification of faulty equipment and the type of fault. One set of flags is associated with each of the two field related checkwords. A third set of flags is used to provide similar information based on evaluating all of the ancillary data checksums within a field. Implementation of these flags is optional.

The checkwords and flags are combined in an error detection data packet which is included as ancillary data. At the receiver, a recalculation of checkwords may be compared to the error detection data packet information to determine if a transmission error has occurred.

## 2 Location of checkwords, flags, identification number, and included samples

### 2.1 Location of checkwords, flags and identification number

Data packets containing the calculated checkwords, error information flags and identification number are located in the ancillary data area of the vertical interval as shown graphically in Figs. 1a and 1b and specified in Table 1 for 525/59.94 systems and Table 2 for 625/50 systems. These locations are chosen to respect the location of source switching points.

The error detection data packet is located immediately prior to the start of active video (SAV) code words in the line prior to that during which source switching occurs.

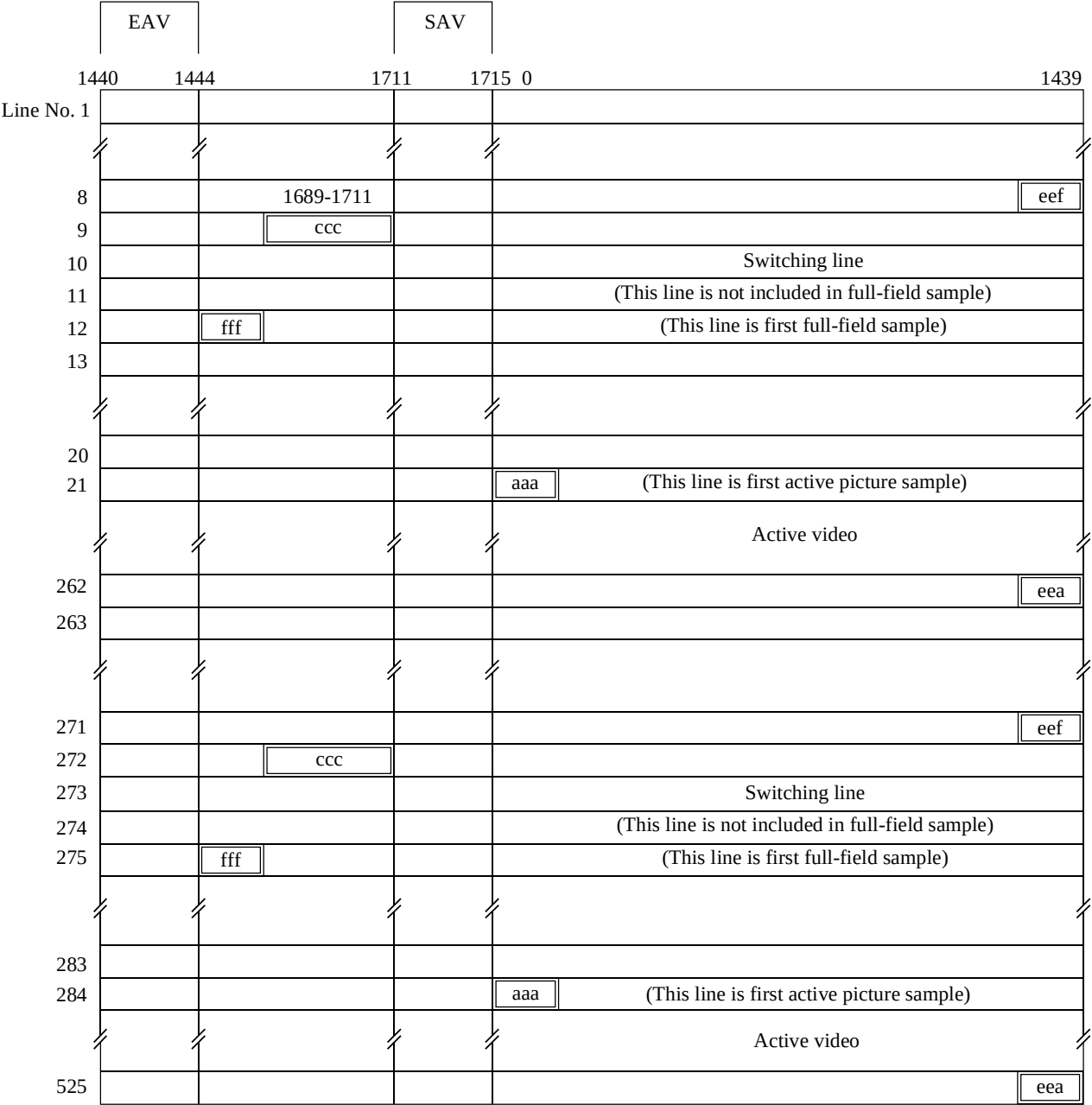
TABLE 1

Location of 525/59.94 system checkwords

| Error checking data locations: line 9, fields I and III and<br>line 272, fields II and IV |                            |
|-------------------------------------------------------------------------------------------|----------------------------|
| Data item                                                                                 | Word No.                   |
| Ancillary Data Flag word 1                                                                | 1 689 (00.0 <sub>h</sub> ) |
| Ancillary Data Flag word 2                                                                | 1 690 (FF.C <sub>h</sub> ) |
| Ancillary Data Flag word 3                                                                | 1 691 (FF.C <sub>h</sub> ) |
| Data Identifier                                                                           | 1 692 (7D.0 <sub>h</sub> ) |
| Data Block Number                                                                         | 1 693 (80.0 <sub>h</sub> ) |
| Data Count                                                                                | 1 694 (44.0 <sub>h</sub> ) |
| Active picture data word 0                                                                | 1 695                      |
| Active picture data word 1                                                                | 1 696                      |
| Active picture data word 2                                                                | 1 697                      |
| Full-field data word 0                                                                    | 1 698                      |
| Full-field data word 1                                                                    | 1 699                      |
| Full-field data word 2                                                                    | 1 700                      |
| Ancillary data error flags                                                                | 1 701                      |
| Active picture error flags                                                                | 1 702                      |
| Full-field error flags                                                                    | 1 703                      |
| Reserved words (7 total)                                                                  | 1 704-1 710                |
| Checksum for this ancillary data packet                                                   | 1 711                      |

NOTE 1 – Values in parentheses are sample values.

FIGURE 1a  
Location of checkwords and included samples (525-line systems)



EAV: end of active video.

- Note 1 – See Table 1 for exact sample locations in both fields.  
Note 2 – ccc: location of checkwords and status flags.  
Note 3 – fff: first sample included in the full-field checkword.  
Note 4 – aaa: first sample included in the active picture checkword.  
Note 5 – eea: last sample included in the active picture checkword.  
Note 6 – eef: last sample included in the full-field checkword.

1304-01a