INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

J.81

Amendment 2
(03/98)

SERIES J: TRANSMISSION OF TELEVISION, SOUND PROGRAMME AND OTHER MULTIMEDIA SIGNALS

Digital transmission of television signals

Transmission of component-codec digital television signals for contribution-quality applications at the third hierarchical level of ITU-T Recommendation G.702

Amendment 2: Appendix IV to Annex A – Results of 34 Mbit/s codec interworking tests (February 1996)

ITU-T Recommendation J.81 – Amendment 2

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION J.81

TRANSMISSION OF COMPONENT-CODED DIGITAL TELEVISION SIGNALS FOR CONTRIBUTION-QUALITY APPLICATIONS AT THE THIRD HIERARCHICAL LEVEL OF ITU-T RECOMMENDATION G.702

AMENDMENT 2

APPENDIX IV
(to Annex A of Recommendation J.81)

Results of 34 Mbit/s codec interworking tests (February 1996)

Source

Amendment 2, Appendix IV to Annex A of ITU-T Recommendation J.81, was prepared by ITU-T Study Group 9 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 18th of March 1998.

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

INTELLECTUAL PROPERTY RIGHTS

The ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. The ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, the ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

Introduction

The following new Appendix IV to Annex A is added to Recommendation J.81. It is recalled that Amendment 1 to Recommendation J.81 added a new Appendix II to Annex A which required renumbering the existing Appendix II as Appendix III at that time.

TRANSMISSION OF COMPONENT-CODED DIGITAL TELEVISION SIGNALS FOR CONTRIBUTION-QUALITY APPLICATIONS AT THE THIRD HIERARCHICAL LEVEL OF ITU-T RECOMMENDATION G.702

AMENDMENT 2

APPENDIX IV

(to Annex A of Recommendation J.81)

Results of 34 Mbit/s codec interworking tests (February 1996)

(Geneva, 1998)

Correct interworking of four manufacturers' codecs was achieved in February 1996, after nearly three years of cooperation between the manufacturers and the EBU. This included correct interworking of the composite analogue interfaces, as specified by the EBU, (see Appendix II above).

The test procedure used for the interworking verification consisted of subjective quality evaluation by expert viewers on a selection of EBU/ITU test sequences, and of objective measurements on analogue audio and video.

Tables A.IV.1 and A.IV.2 below summarize the interworking test results for video and audio respectively. A more comprehensive description of the interworking tests is available in the EBU Technical Review No. 269 [1].

At the time of the tests, one manufacturer had not yet implemented SECAM interfaces or ITS and IDS transmission, but in all other respects correct interworking was achieved. The combination "encoder (No. 2) – decoder (No. 1)" gave an alarm signal inversion for the absence of the 34 Mbit/s signal at the input to the decoder. This was the only remaining anomaly in February 1996 and this minor problem was subsequently corrected.

Recovery times, after an interruption of the encoder video input signal, and after an interruption of the decoder 34 Mbit/s input signal, were satisfactory for all combinations of encoder-decoder, namely < 0.5 s and < 2 s respectively.

Audio/video delay differential was also satisfactory for all combinations of encoder-decoder, namely < 2 ms.

All encoders utilize comb-filters to decode PAL and NTSC respectively, thereby obtaining clean component signals, virtually free from luminance/chrominance crosstalk.

Subjective evaluation, carried out in accordance with ITU-R Recommendation BT.500-7, of one generation and three generations of 34 Mbit/s (Recommendation J.81) coding, using ITU-R BT.601-5 interconnections between codecs, gave scores of 4.5 and 4 respectively, on the 1 to 5 scale for picture quality. Audio transmission, using ITU-T J.57 coding, was transparent.

Table A.IV.1/J.81 – 34 Mbit/s encoder/decoder interworking video test results – February 1996

Encoder \ Decoder	Decoder No. 1	Decoder No. 2	Decoder No. 3	Decoder No. 4
Encoder No. 1	Ext. IDS/ITS: OK Int. IDS/ITS: OK Scrambling (mode 1): OK Video: OK Audio: OK	Ext. IDS/ITS: OK Int. IDS/ITS: OK Scrambling (mode 1): OK Video: OK Audio: OK	Ext. IDS/ITS: OK Int. IDS/ITS: OK Scrambling (mode 1): OK Video: OK Audio: OK	Ext. IDS/ITS: OK Int. IDS/ITS: OK No Int./Ext. IDS Scrambling (mode 1): OK Video: OK but no SECAM coder available in No. 4 decoder Audio: OK
Encoder No. 2	Ext. IDS/ITS: OK Int. IDS/ITS: OK Scrambling (mode 1): OK Video: OK but "34 M absent" alarm Audio: OK	Ext. IDS/ITS: OK Int. IDS/ITS: OK Scrambling (mode 1): OK Video: OK Audio: OK	Ext. IDS/ITS: OK Int. IDS/ITS: OK Scrambling (mode 1): OK Video: OK Audio: OK	Ext. ITS: OK No Int. ITS No Int./Ext IDS Scrambling (mode 1): OK Video: OK but no SECAM coder available in No. 4 decoder Audio: OK
Encoder No. 3	Ext. IDS/ITS: OK Int. IDS/ITS: OK Scrambling (mode 1): OK Video: OK Audio: OK	Ext. IDS/ITS: OK Int. IDS/ITS: OK Scrambling (mode 1): OK Video: OK Audio: OK	Ext. IDS/ITS: OK Int. IDS/ITS: OK Scrambling (mode 1): OK Video: OK Audio: OK	Ext. ITS: intermittent in regular sequence No Int. ITS Scrambling (mode 1): OK Video: OK but no SECAM coder available in No. 4 decoder Audio: OK
Encoder No. 4	Ext. ITS: OK No Int. ITS No Int./Ext. IDS Scrambling (mode 1): OK Video: No SECAM decoder available in No. 4 encoder Audio: OK	Ext. ITS: OK No Int. ITS No Int./Ext. IDS Scrambling (mode 1): OK Video: No SECAM decoder available in No. 4 encoder Audio: OK	Ext.ITS: Intermittent No Int. ITS No Int./Ext. IDS Scrambling (mode 1): OK Video: No SECAM decoder available in No. 4 encoder Audio: OK	Ext.ITS: OK No Int. ITS No Int./Ext. IDS Scrambling (mode 1): OK Video: OK but no SECAM available in No. 4 encoder or decoder Audio: OK

NOTE – Encoders and decoders No. 4 were manufactured by a combination of two companies who now supply the equipment as two separate manufacturers. Both manufacturers have subsequently implemented ITS and IDS transmission.

Table A.IV.2/J.81 – 34 Mbit/s encoder/decoder interworking video test results – February 1996

Encoder \ Decoder	Decoder No. 1	Decoder No. 2	Decoder No. 3	Decoder No. 4
Encoder No. 1	Frequency/attenuation 40 Hz-15 kHz: ± 0.1 dB 1020 Hz/+9 dBm THD < 0.1% 60 Hz/+9 dBM THD < 0.1% X-talk: 79.8 dB S/N (wtd): 73.3 dB	Frequency/attenuation 40 Hz-15 kHz: ± 0.1 dB 1020 Hz/+9 dBm THD < 0.1% 60 Hz/+9 dBM THD < 0.1% X-talk: 76.8 dB S/N (wtd): 75.8 dB	Frequency/attenuation 40 Hz-15 kHz: ± 0.1 dB 1020 Hz/+9 dBm THD < 0.1% 60 Hz/+9 dBM THD < 0.1% X-talk: 77.6 dB S/N (wtd): 75.4 dB	Frequency/attenuation 40 Hz-15 kHz: ± 0.1 dB 1020 Hz/+9 dBm THD < 0.1% 60 Hz/+9 dBM THD < 0.1% X-talk: 83.0 dB S/N (wtd): 74.3 dB
Encoder No. 2	Frequency/attenuation 40 Hz-15 kHz: ± 0.1 dB 1020 Hz/+9 dBm THD < 0.1% 60 Hz/+9 dBm THD < 0.1% X-talk: 78.5 dB S/N (wtd): 73.6 dB	Frequency/attenuation 40 Hz-15 kHz: ± 0.1 dB 1020 Hz/+9 dBm THD < 0.1% 60 Hz/+9 dBm THD < 0.1% X-talk: 82.9 dB S/N (wtd): 74.6 dB	Frequency/attenuation 40 Hz-15 kHz: ± 0.1 dB 1020 Hz/+9 dBm THD < 0.1% 60 Hz/+9 dBm THD < 0.1% X-talk: 79.6 dB S/N (wtd): 78.3 dB	Frequency/attenuation 40 Hz-15 kHz: ± 0.1 dB 1020 Hz/+9 dBm THD < 0.1% 60 Hz/+9 dBm THD < 0.1% X-talk: 77.1 dB S/N (wtd): 71.2 dB
Encoder No. 3	Frequency/attenuation 40 Hz-15 kHz: ± 0.1 dB 1020 Hz/+9 dBm THD < 0.1% 60 Hz/+9 dBm THD < 0.1% X-talk: 81.5 dB S/N (wtd): 76.6 dB	Frequency/attenuation 40 Hz-15 kHz: ± 0.1 dB 1020 Hz/+9 dBm THD < 0.1% 60 Hz/+9 dBm THD < 0.1% X-talk: 85.8 dB S/N (wtd): 81.8 dB	Frequency/attenuation 40 Hz-15 kHz: ± 0.1 dB 1020 Hz/+9 dBm THD < 0.1% 60 Hz/+9 dBm THD < 0.1% X-talk: 84.5 dB S/N (wtd): 82.5 dB	Frequency/attenuation 40 Hz-15 kHz: ± 0.1 dB 1020 Hz/+9 dBm THD < 0.1% 60 Hz/+9 dBm THD < 0.1% X-talk: 84.3 dB S/N (wtd): 79.9 dB
Encoder No. 4	Frequency/attenuation 40 Hz-15 kHz: ± 0.1 dB 1020 Hz/+9 dBm THD < 0.1% 60 Hz/+9 dBm THD < 0.1% X-talk: 78.6 dB S/N (wtd): 68.1 dB	Frequency/attenuation 40 Hz-15 kHz: ± 0.1 dB 1020 Hz/+9 dBm THD < 0.1% 60 Hz/+9 dBm THD < 0.1% X-talk: 84.5 dB S/N (wtd): 70.5 dB	Frequency/attenuation 40 Hz-15 kHz: ± 0.1 dB 1020 Hz/+9 dBm THD < 0.1% 60 Hz/+9 dBm THD < 0.1% X-talk: 81.6 dB S/N (wtd): 73.1 dB	Frequency/attenuation 40 Hz-15 kHz: ± 0.1 dB 1020 Hz/+9 dBm THD < 0.1% 60 Hz/+9 dBm THD < 0.1% X-talk: 83.0 dB S/N (wtd): 77.9 dB

Bibliography

[1] FLOWERS (B.G.): Interworking tests on 34 Mbit/s encoders-decoders, *EBU Technical Review*, No. 269, Autumn 1996.

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