



Fig. T-7. Mk. III Flying Spot Telecine (Rank Cintel).

machines. The film transports used are the 600 Series High-Speed Electronic Inter-

lock type. The method of interlock is the SMPTE edit time code. The time code recorded on the videotape is the master drive for the sprocketed film transports. A multichannel audiotape recorder may also be interlocked.

Marconi Electronics Inc. developed a television film chain, the B3404 (Fig. T-6) which represents a significant departure from the conventional approach to multiplex telecine. It is an integrated device using two film projectors and two slide projectors plus optics and camera head in the same cabinet.

Rank Cintel introduced the Mk III Flying Spot Telecine (Fig. T-7). The machine can handle 16mm or 35mm films by a simple interchange of a few mechanical parts. All versions are dual standard for 625- or 525-line operation.

*Wireless Microphones:* Seatcom Inc., introduced a new wireless microphone system for operating in the 950 MHz band. The system uses a spaced diversity reception system and is designed for use of up to 5 channels simultaneously. Fading and crosstalk have been virtually eliminated in this system design.

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## EUROPEAN BROADCASTING UNION

As was no doubt the case in other parts of the world, the development of television broadcasting by the organizations participating in Eurovision program exchanges by terrestrial circuits was affected considerably by the economic recession during 1975. Many of the older organizations which have already completed the construction of their production centers and transmitting networks were obliged to reduce the hours of programming slightly, or were able only to maintain the level of output of the previous year, and the newer ones have made less progress in expanding their facilities than might otherwise have been the case. The growth in the number of color television receivers was also slower than in previous years, especially in the countries where the market had been large initially. Details of the situation in the various countries are given in Tables I and II, the latter referring to the color television services.

It may be seen from Table II that three more organizations, all in North Africa, have introduced color television broadcasting during the past year. Furthermore, the RAI (Italy) has been authorized to introduce color in its two national networks during 1976, using the PAL system. The experimental color transmissions in Spain have become more numerous and it is reported that more than 100,000 PAL color receivers are now in use in that country. Finally, the First Network (TF1) in France introduced a limited color service in the autumn of 1975; because the original VHF

monochrome transmission system using 819-line scanning must be retained as long as a significant number of receivers are unable to operate on 625 lines, the color service is broadcast by the UHF transmitters of the Regional network FR3 at times when the latter is not scheduled. A permanent UHF transmitter covering the Paris area entered service at Christmas and it is planned to make the TF1 color service available in the principal provincial centers by this means during the next few years.

The introduction of color in TF1 also meant that, for the first time, all national television programs broadcast in Europe were available with a single video scanning standard — 625 lines/frame, 50 fields/s. Even although several different systems for modulating the RF carriers and two color standards remain in use, this significant development, occurring 21 years after the first live international program exchanges now known as Eurovision, will facilitate both receiver design and transmitter assignment planning.

The statistics for the Eurovision transmissions planned and coordinated by the Union during 1975 show a significant growth in the number of scheduled news exchanges, of which there were 5789 compared with 4767 in the previous year. This more than compensated the slight decline in other types of program transmission, which numbered 5126 compared with 5343 in 1974, so that the total duration at the origin increased from 2501 to

2716 hours. An average of over 30 broadcasting organizations now participate regularly in the principal news exchanges; they include the seven Intervention members in Eastern Europe as well as certain E.B.U. members in the Middle East and North America, where satellite links are necessary. Additional participation from the Arabic-speaking countries, such as the Egyptian television service which rejoined the Union at the end of 1975, is expected in the future.

The most elaborate and memorable television programs distributed by Eurovision during 1975 were undoubtedly the coverage of the Apollo-Soyuz space flight, between 15 and 24 July, in which the friendly cooperation of the American and Russian astronauts reflected that between the technical staffs involved in bringing it to the public. Among other novel achievements on that occasion, the experimental Symphonie satellite was used to relay television signals from the USSR to France.

As usual, coverage of sports events was the most important source of programs exchanged internationally, although there were no major international championships during the year. Following the agreement ultimately reached with the organizers, work on planning the arrangements for covering the 1976 Olympic Games in Montreal began in the autumn and studies of the technical problems involved in covering the World Football championships,

**Table I. Expansion of Television During 1975: Principal Characteristics of the Television Services Participating Regularly in Eurovision at the End of 1974 and 1975.**

| Country and programme designation | Transmission system* | No. of television transmitters |          | Coverage of population % |                   | Programme hours per week |                    | Network length (km) |       |       |      | Estimated No. of receivers (thousands) |       | Estimated No. of receivers per 100 persons |      |
|-----------------------------------|----------------------|--------------------------------|----------|--------------------------|-------------------|--------------------------|--------------------|---------------------|-------|-------|------|--|-------|--|------|
|                                   |                      |                                |          |                          |                   |                          |                    | radio-relay         |       | cable |      |  |       |  |      |
|                                   |                      | 1975                           | 1974     | 1975                     | 1974              | 1975                     | 1974               | 1975                | 1974  | 1975  | 1974 | 1975                                   | 1974  | 1975                                       | 1974 |
| Algeria                           | RTA B-PAL            | 40                             | 40       |                          |                   |                          |                    | 2800                |       |       |      | 425                                    | 410   | 2.7  | 2.6  |
| Austria                           | ORF-1 B(G)PAL        | 207(62)                        | 201(42)  | 90.3                     | 89.7              | 55.8                     | 61                 | 7858                | 7578  | 72    | 72   | 1850                                   |       | 24.8                                       |      |
|                                   | ORF-2 G(B)PAL        | 244(17)                        | 205(11)  | 86.9                     | 85.9              | 48.5                     | 42                 |                     |       |       |      |  |       |  |      |
| Belgium                           | BRT H-PAL (C)        | 6(4)                           | 6(4)     | 99.8                     | 99.8              | 54.3 <sup>4</sup>        | 52.5 <sup>4</sup>  | 3425                | 3425  | 0     | 0    | 2300                                   |       | 23.5                                       |      |
|                                   | RTB H-PAL (C)        | 7(11)                          | 7(11)    | 92.8                     | 92.8              | 57.2 <sup>4</sup>        | 58.1 <sup>4</sup>  |                     |       |       |      |  |       |  |      |
| Denmark                           | DR B-PAL             | 30                             | 30       | 99.9                     | 99.9              | 44.5                     | 44.5               | 2964                | 2964  | 124   | 124  | 1610                                   | 1600  | 31.8                                       | 31.7 |
| Finland                           | YLE-1 B-PAL          | 63                             | 60       | 99                       | 99                | 63                       | 60                 | 9697                | 8835  | 0.5   | 0.5  | 1400                                   |       | 29.3                                       |      |
|                                   | YLE-2 G(B)PAL        | 13(14)                         | 11(12)   | 84                       | 82                | 31                       | 30                 |                     |       |       |      |  |       |  |      |
| France                            | TF1 E (L-SECAM)      | 1301(3)                        | 1213     | 99(12)                   | 98.5              | 76.5 <sup>4</sup>        | 62 <sup>4</sup>    |                     |       |       |      |  |       |  |      |
|                                   | A2 L-SECAM           | 973                            | 883      | 98                       | 98.05             | 70.5 <sup>4</sup>        | 49.5 <sup>4</sup>  | 41750               | 39170 | 350   | 350  | 14000                                  |       | 26.0                                       |      |
|                                   | FR3 L-SECAM          | 137                            | 96       | 80                       | 62                | 24.5                     | 23.5               |                     |       |       |      |  |       |  |      |
| Germany (F.R.)                    | ARD-1 B(G)PAL        | 1070(204)                      | 913(187) | 97                       | 97                | 63 <sup>6</sup>          | 65.5 <sup>6</sup>  |                     |       |       |      |  |       |  |      |
|                                   | ZDF G(B)PAL          | 1651(2)                        | 1549(2)  | 96.7                     | 96.6              | 62.7                     | 60.5               | 32004               | 30718 | 740   | 740  | 19250                                  | 19000 | 31.7                                       | 31.3 |
|                                   | ARD-3 G(B)PAL        | 1648(2)                        | 1546(2)  | 94                       | 93.8              | 42.5 <sup>5</sup>        | 43 <sup>5</sup>    |                     |       |       |      |  |       |  |      |
| Greece                            | EIRT B               | 17                             | 17       | 95                       | 90                | 48.5                     | 40                 | 3020                | 3020  | 13    | 0    | 1050                                   | 950   | 12.0                                       | 10.8 |
| Ireland                           | RTE I-PAL (A)        | 19(7)                          | 20(7)    | 98                       | 98                | 66                       | 66 <sup>4</sup>    |                     |       | 0     | 0    | 600                                    |       | 20.2                                       |      |
| Italy                             | RAI-1 B-PAL          | 797                            | 797      | 98.1                     | 98.1              | 62.5                     | 66.5               | 30182               | 28494 | 277   | 277  | 11600                                  |       | 21.4                                       |      |
|                                   | RAI-2 G-PAL          | 406                            | 391      | 91                       | 91                | 35.7                     | 34.2               |                     |       |       |      |  |       |  |      |
| Libya                             | FRBC B               | 11                             | 10       |                          |                   |                          |                    |                     |       |       |      |  |       | 20   | 1.0  |
| Luxembourg                        | RTL (G-PAL) L-SECAM  | 1(2)                           | 1(2)     | 92/99                    | 92/99             | 40                       | 37                 | 16                  | 16    | 0     | 0    | 84                                     | 82    | 23.8                                       | 23.2 |
| Malta                             | TVM B                | 1                              | 1        | 99                       | 99                | 38.8                     | 36                 | 5                   | 5     | 0     | 0    | 65                                     |       | 20.4                                       |      |
| Monaco                            | TMC-1 E 625-SECAM    | 1                              | 1        | 100                      | 100               | 32                       | 32                 | 16                  | 16    | 0     | 0    | 10                                     | 10    | 50   |      |
|                                   | TMC-2 G-SECAM        | 1                              | 1        | 80                       | 80                | 17.5                     | 17.5               |                     |       |       |      |  |       |  |      |
| Morocco                           | RTM B-SECAM          | 24                             | 24       | 79                       | 78                | 44                       | 48                 | 4108                | 4108  | 0     | 0    | 376                                    |       | 2.2  |      |
| Netherlands                       | NOS-1 B-PAL          | 4(9)                           | 4(7)     | 100                      | 100               | 49 <sup>4</sup>          | 43.2 <sup>4</sup>  | 3068                | 3131  |       | 174  | 3650                                   | 3600  | 26.6                                       | 26.5 |
|                                   | NOS-2 G(B)PAL        | 13                             | 11       | 99                       | 99                | 34 <sup>4</sup>          | 33.4 <sup>4</sup>  |                     |       |       |      |  |       |  |      |
| Norway                            | NRK B-PAL            | 719                            | 648      | 96.3                     | 96.3              | 44.7 <sup>4</sup>        | 43.8               | 12163               | 12163 | 16    | 16   | 1100                                   | 1080  | 27.4                                       | 27.3 |
| Portugal                          | RTP-1 B              | 39                             | 39       | 96                       | 96                | 85 <sup>4</sup>          | 81 <sup>4</sup>    | 3514                | 3514  | 0     | 0    | 690                                    |       | 8.6  |      |
|                                   | RTP-2 G              | 6                              | 6        | 32                       | 32                | 25                       | 26                 |                     |       |       |      |  |       |  |      |
| Spain                             | TVE-1 B**            | 710                            | 699      | 93.1                     | 93                | 71.8                     | 64.5               | 14072               | 11632 | 0     | 0    | 6640                                   | 6125  | 19.1                                       | 17.6 |
|                                   | TVE-2 G(B)**         | 49(3)                          | 39(3)    | 60.5                     | 58                | 31                       | 30                 |                     |       |       |      |  |       |  |      |
| Sweden                            | SR-1 B(G)PAL         | 209(10)                        | 206(10)  | 99.6                     | 99.6              | 41.9                     | 42.4               | 32000               | 31500 | 610   | 550  | 2910                                   | 2840  | 35.5                                       | 34.7 |
|                                   | SR-2 G-PAL           | 174                            | 149      | 98.9                     | 98.5              | 38.8                     | 38.4               |                     |       |       |      |  |       |  |      |
| Switzerland                       | SRG B(G)PAL          | 175(90)                        | 167(77)  | 98.9 <sup>1</sup>        | 98.8 <sup>1</sup> | 66                       | 63                 |                     |       |       |      |  |       |  |      |
|                                   | SSR B(G)PAL          | 56(125)                        | 56(94)   | 90 <sup>2</sup>          | 80 <sup>2</sup>   | 56                       | 57                 | 2374                | 2374  | 0     | 0    | 1750                                   |       | 27.9                                       |      |
|                                   | TS-1 B(G)PAL         | 46(141)                        | 45(111)  | 90 <sup>3</sup>          | 72 <sup>3</sup>   | 59                       | 55                 |                     |       |       |      |  |       |  |      |
| Tunisia                           | RTT B-SECAM          | 7                              | 7        | 98                       | 98                | 56                       |                    | 2600                | 2600  | 0     | 0    | 220                                    |       | 4.3  |      |
| Turkey                            | TRT B                | 44                             | 6        | 60                       | 55                | 45 <sup>4</sup>          | 54 <sup>4</sup>    | 2004                | 1450  | 0     | 0    | 900                                    | 500   | 2.2  | 1.4  |
| United Kingdom                    | BBC-1 I-PAL (A)      | 198(110)                       | 144(110) | 96                       | 94.5              | 98 <sup>4</sup>          | 103 <sup>4</sup>   | 8372                | 8372  | 851   | 837  | 18000                                  | 17750 | 32.2                                       | 32.7 |
|                                   | BBC-2 I-PAL          | 197                            | 145      | 96.5                     | 94.5              | 78 <sup>4</sup>          | 66 <sup>4</sup>    |                     |       |       |      |  |       |  |      |
| Yugoslavia                        | IBA I-PAL (A)        | 195(47)                        | 146(47)  | 95.8                     | 95                | 94 <sup>4</sup>          | 102.5 <sup>4</sup> | 5900                | 7640  | 430   | 420  |  |       |  |      |
|                                   | JRT-1 B-PAL          | 331                            | 390      | 95                       | 95                | 77                       | 77                 | 17894               | 15605 | 0     | 0    | 2800                                   |       | 13.5                                       |      |
|                                   | JRT-2 G-PAL          | 42                             |          | 25                       | 25                | 32                       | 23                 |                     |       |       |      |  |       |  |      |

Notes: Brackets ( ) are used to distinguish the characteristics of the service provided by the transmitters identified in this way.

\* The various transmission systems are identified by means of the letters used in C.C.I.R. Report 624, XIIIth Plenary Assembly, Geneva, 1974.

\*\* Experimental colour transmissions.

- (1) Proportion of population within the coverage area of at least 1 programme service.
- (2) Proportion of population within the coverage area of at least 2 programme services.
- (3) Proportion of population within the coverage area of at least 3 programme services.
- (4) Data includes duration of educational programmes that are not broadcast throughout the year.
- (5) Average figures applicable in the regions in which this service is provided.
- (6) Certain transmitters broadcast an additional 21 hours per week in the mornings.

which are to be held in Argentina in 1978, have been undertaken.

Various activities undertaken jointly by persons drawn from Members' staffs were again organized by the E.B.U. Technical Committee during 1975. They included the preparation of two Technical Monographs, entitled *Lighting for Colour Television*, and *The Organisation of Measures to Control Electrical Interference with Broadcast Reception*, both of which have been published by the Technical Centre, as

well as various publications dealing with recommended practices in fields associated with broadcasting. Among the various Working Parties reporting to the Committee were those concerned with digital coding of sound and television, cable distribution, recording sound and pictures, television and sound broadcasting, and the Eurovision satellite scheme. With regard to satellite broadcasting, work had been concentrated on planning for the utilization of the 12 GHz band, including modulation

techniques, receiver characteristics, protection ratios and orbital positions, with a view to enabling broadcasters to prepare for the World Administrative Radio Conference which is to be held by the I.T.U. in 1977. Measurements of the signals received in Europe from the ATS-6 experimental transmissions intended for India have also been undertaken; it is hoped that the experience thus obtained will someday be useful in evaluating the first European direct-broadcasting satellite.

Table II. Figures Available as of 31 December 1975 for the Color Broadcast by the E.B.U. Active Members.

| Country:<br>Programme<br>service | Number of<br>transmitters |      | Colour programmes<br>hours per week |                 | Coverage          |                   |                              |       | Estimated No.<br>of colour receivers<br>(thousands) |      |
|----------------------------------|---------------------------|------|-------------------------------------|-----------------|-------------------|-------------------|------------------------------|-------|---|------|
|                                  | 1975                      | 1974 | 1975                                | 1974            | Percentage        |                   | No. of persons<br>(millions) |       | 1975  | 1974 |
|                                  |                           |      |                                     |                 | 1975              | 1974              | 1975                         | 1974  |   |      |
| Algeria                          |                           |      |                                     |                 |                   |                   | 15.2                         |       |   |      |
| RTA                              | 40                        | 40   |                                     |                 |                   |                   |                              |       |   |      |
| Austria                          |                           |      |                                     |                 |                   |                   |                              |       |   |      |
| ORF-1                            | 269                       | 243  | 45.5                                | 47              | 90.3              | 89.7              | 6.8                          | 6.7   |   | 450  |
| ORF-2                            | 261                       | 216  | 39.2                                | 32              | 86.9              | 85.9              |                              |       |   |      |
| Belgium                          |                           |      |                                     |                 |                   |                   |                              |       |   |      |
| BRT                              | 6                         | 6    | 51                                  | 44.0            | 99.8              | 99.8              | 9.4                          | 9.3   | 450   | 350  |
| RTB                              | 7                         | 7    | 49.6                                | 41.8            | 92.8              | 92.4              |                              |       |   |      |
| Denmark                          |                           |      |                                     |                 |                   |                   |                              |       |   |      |
| DR                               | 30                        | 30   | 32                                  | 26.5            | 99.9              | 99.9              | 5.0                          | 4.9   |   | 275  |
| Finland                          |                           |      |                                     |                 |                   |                   |                              |       |   |      |
| YLE-1                            | 63                        | 60   | 23                                  | 25              | 99                | 99                | 4.6                          | 4.6   |   | 120  |
| YLE-2                            | 27                        | 23   | 16                                  | 20              | 84                | 82                |                              |       |   |      |
| France                           |                           |      |                                     |                 |                   |                   |                              |       |   |      |
| TF1                              | 3                         |      | 21.5                                |                 | 12                |                   |                              |       |   |      |
| A2                               | 973                       | 883  | 62.1                                | 47              | 98                | 98                | 50                           | 50    |   | 2200 |
| FR3                              | 137                       | 96   | 25.5                                | 21              | 80                | 62                |                              |       |   |      |
| Germany (F.R.)                   |                           |      |                                     |                 |                   |                   |                              |       |   |      |
| ARD-1                            | 1274                      | 1100 | 59                                  | 59              | 97                | 97                |                              |       |   |      |
| ZDF                              | 1653                      | 1551 | 62                                  | 60              | 96.7              | 96.6              | 60                           | 60    |   | 6900 |
| ARD-3                            | 1650                      | 1548 | 37 <sup>5</sup>                     | 38 <sup>5</sup> | 94                | 93.8              |                              |       |   |      |
| Ireland                          |                           |      |                                     |                 |                   |                   |                              |       |   |      |
| RTE                              | 19                        | 20   | 59.4                                | 35              | 98                | 98                | 3                            | 3     | 80  | 50   |
| Luxembourg                       |                           |      |                                     |                 |                   |                   |                              |       |   |      |
| RTL                              | 3                         | 3    | 38.7                                | 35              | 92                | 92                | 0.3*                         | 0.3*  |   | 20   |
| Monaco                           |                           |      |                                     |                 |                   |                   |                              |       |   |      |
| TMC-1                            | 1                         | 1    | 16                                  | 16              | 100               | 100               | 0.05*                        | 0.05* |   | 5    |
| TMC-2                            | 1                         | 1    | 16                                  | 16              | 80                | 80                |                              |       |   |      |
| Morocco                          |                           |      |                                     |                 |                   |                   |                              |       |   |      |
| RTM                              | 24                        |      | 41.8                                |                 | 79                |                   | 12.6                         |       |   |      |
| Netherlands                      |                           |      |                                     |                 |                   |                   |                              |       |   |      |
| NOS-1                            | 13                        | 11   | 45.6                                | 37.6            | 100               | 100               | 13                           | 13    |   | 1000 |
| NOS-2                            | 13                        | 11   | 31.6                                | 29.1            | 99                | 99                |                              |       |   |      |
| Norway                           |                           |      |                                     |                 |                   |                   |                              |       |   |      |
| NRK                              | 719                       | 648  | 34.5                                | 29.7            | 96.3              | 96.2              | 3.9                          | 3.9   |   | 120  |
| Sweden                           |                           |      |                                     |                 |                   |                   |                              |       |   |      |
| SR-1                             | 219                       | 216  | 35.1                                | 38              | 96.6              | 96.6              | 8                            | 8     |   | 1080 |
| SR-2                             | 174                       | 149  | 31.0                                | 35              | 98.9              | 98.5              |                              |       |   |      |
| Switzerland                      |                           |      |                                     |                 |                   |                   |                              |       |   |      |
| SRG                              | 265                       | 244  |                                     | 57              | 98.9 <sup>1</sup> | 98.8 <sup>1</sup> |                              |       |   |      |
| SSR                              | 181                       | 150  |                                     | 51              | 90 <sup>2</sup>   | 80 <sup>2</sup>   | 6.4                          | 6.4   | 480   | 430  |
| TS-1                             | 187                       | 156  |                                     | 50              | 90 <sup>3</sup>   | 72 <sup>3</sup>   |                              |       |   |      |
| Tunisia                          |                           |      |                                     |                 |                   |                   |                              |       |   |      |
| RTT                              | 7                         | 7    | 14                                  |                 | 98                | 98                | 5.4                          | 5.4   |   |      |
| United Kingdom                   |                           |      |                                     |                 |                   |                   |                              |       |   |      |
| BBC-1                            | 198                       | 144  | 91                                  | 89              | 96                | 94.5              |                              |       |   |      |
| BBC-2                            | 197                       | 145  | 51                                  | 46              | 96.5              | 94.5              | 51                           | 51    |   | 6900 |
| IBA                              | 195                       | 146  | 94                                  | 102             | 95.8              | 95.0              |                              |       |   |      |
| Yugoslavia                       |                           |      |                                     |                 |                   |                   |                              |       |   |      |
| JRT-1                            | 331                       | 390  | 10                                  | 10              | 95 <sup>1</sup>   | 95                | 20                           | 20    |   | 20   |
| JRT-2                            | 42                        |      | 19                                  | 13              | 25 <sup>2</sup>   | 25                |                              |       |   |      |

\* Major additional coverage in neighbouring countries