

difference is so drastic and noticeable that no further comment is necessary. Relative illumination distribution over the image field at infinity is illustrated in Fig. 7. Permill distortion (distortion in parts per thousand) is graphed in Fig. 8, also over the full image width; again, no significant deviation appears. Figure 9 shows clearly that the lateral chromatic aberration for red ($\lambda = 610$ nm) and blue ($\lambda = 480$ nm), taken against green ($\lambda = 546$ nm) as the reference color, is virtually nil and, therefore, no visible color fringing appears within the image. (Note that the lateral chromatic aberration over the image field is shown in micrometers in Fig. 9.)

In a projection lens, no iris diaphragm is required, and thus all the foregoing data have been quoted for maximum relative aperture. Also, all results are quoted for an infinity setting because — in practical use — the projection distance is so large in relation to the focal length of the lens that an exact focus adjustment will not alter the

imaging quality. The new Cinelux-Ultra series will accept (as does the Super-Kiptar series) an anamorphic supplementary lens.

Conclusions

In addition to the development of completely new optical systems, an important task for the lens manufacturer is to update existing lens designs and thereby to advance the state of the art. The description of the salient features of the new optical projection system shows a very definite quality improvement over the original system. This advance — obtained with no substantial extra expenditures — can be ascribed to the setting of more precise initial specifications, to the use of new design concepts in conjunction with modern methods of calculation, and to the use of new optical materials.

In the series production of any technical product, one has to take into account the inevitable manufacturing tolerances. This

also applies, of course, to the production of optical systems. So as not to impair the technical advances achieved in the new series, these tolerances have been set within exceptionally tight limits. Finally, appropriate computations determine the type of mechanical construction and the methods of production. In the image forming chain from the subject to the camera, through the printer, and to the projected picture, the projection lens is the final link of the chain, and as such it has a decisive influence on the image quality of the picture on the screen. Because a considerable expenditure of money and effort goes into the production of a film (particularly an entertainment film), the optical reproduction system is of utmost importance if the finished work is to be presented without any loss of quality to an audience. Using a proper optical reproduction system, consisting of specially calculated high performance lenses, fulfills the demand for faultless picture reproduction.

Multilingual Television

Addendum to the Progress Report on Canada in the May 1980 issue of the SMPTE Journal

CFMT-TV, Canada's first multilingual television station (referred to as MTV) became a fledgling entity in the highly competitive Toronto market on 3 September 1979. MTV entered into the market place with a mandate unlike any other in the North American continent — to provide a television service that both English-speaking and non-English-speaking viewers could relate to and enjoy. The English language is used in about 40% of the programming with the remaining 60% multilingual. MTV is now broadcasting in some 20 languages within the broadcast week.

Some of the problems involved in dealing with multilingual programming include: (1) doing 20 different audio carts for one commercial; (2) the inability of studio crews to communicate in the sponsor's language; (3) the inability of the Director to communicate with the sponsor; and (4) special character generator requirements.

As in most cases, the broadcast facilities were assembled within a remarkably short time frame. MTV acquired a 20-year lease on a government building which had formerly been a warehouse for a large food chain and, as can be imagined, the interior of the building (78,000 ft² or 7,250 m²) had to be thoroughly renovated. Construction, based on plans drawn up by Raymond Moiryama Architects, began on 4 June 1979, a mere three months before the scheduled "sign on." We are certainly pleased to report that all schedules were met and the result was a thoroughly renovated warehouse turned television center.

The center also houses a printing and newspaper operation.

MTV is manned by a full time staff of 115 members, headed by President Dan Ianuzzi, which includes a nine-member Engineering staff.

The station broadcasts from the CN Tower on UHF channel 47. The transmitter is a Townshend TA, 55 NET, 55 kW using a tetrode aural and klystron visual with a pye driver, purchased through Comad Communications and installed by Townshend Associates and Immad.

There looms a distinct possibility that the high end UHF stations in Canada may be asked to relocate to mid-band UHF. As it turns out, a local station falls into this category. In order to prepare for the future, MTV entered into an agreement which provides for a channel 47 and 41 antenna, combiner, patch panel and power divide system. This equipment was supplied and installed by EMI. The antenna system is an EMI-slot eight-tier system with a 90-kW capability. The antenna transmitter combination provides coverage that radiates an "A" contour approximately 90 km in radius giving a potential viewing market of three million. At present CFMT is on 50 cable companies within its coverage area.

Studios and Equipment

At the television center, three studios were constructed to handle commercial production, program production and live programming. EMI 2005 and Philips PC60 cameras are used in these studios. The

switching is accomplished by a Ross 500-5-24 switcher which has proven to be both reliable and versatile enough to meet the production requirements. The audio mixing is by a Ward Beck 20 × 4 × 2 which has proven more than adequate for all applications.

Master Control was designed to be functional as both MCR and Studio Control Room for off hours or live programming. The switcher was provided by Image Video. The unit has standard MCR requirements plus DSK, CHK, auto fade and programmable wipes. The central equipment area contains standard gear. Approximately 70% of all the equipment is manufactured in Canada.

Sony provided three editing units, the BVU-200A, BVE500A and the BVH1000, and also provided six BVU-200As which are used for all commercial playbacks.

The MTV mobile has a three-camera capability. Purchased from a local university, it has seen much action, particularly for sports events. The truck is equipped with three Fernseh KC P-40 cameras. It will shortly be rebuilt to carry four cameras, one "C" format VTR and Slo-Mo.

A CFMT subsidiary has been allocated channel 200 of Anik A03 Transponder II. This is on an experimental basis but is expected to become a permanent part of CFMT programming. At first, 63 hours per week will be broadcast including many ethnic-oriented programs.

Through MTV America, MTV will air some of its programs in the United States on a delayed basis, sold mostly to cable companies for community access programming; in some cases the programs will be viewed on basic service.