View of the session room during the Videodisc Systems session.

A Report on the 115th SMPTE Technical Conference

EXPECTATIONS always run high whenever SMPTE meets in Los Angeles. As evidenced by the heavy registration for the technical sessions and the huge crowds at the Equipment Exhibit, the 115th exceeded even the most optimistic estimates.

Though no claims are being made about breaking any records, since no records of this type are kept anyway, the Society can point with pride to the large, steady flow of people who were in attendance throughout Conference Week.

Spot checking the sessions showed high interest in most of them. The session attendance reached its peak, however, on Friday morning, when more than 500 persons jammed the session room to hear papers on Consumer Videodisc Player Systems. It's been a long time since so much interest had been generated by a single session, particularly on a Friday morning which had traditionally been a day of doldrums at SMPTE Conferences.

The totals look impressive. More than 1,000 registered for the technical sessions; another 2,000 passed through the Equipment Exhibit. This fine turnout can only be attributed to the attractive papers program and the full range of equipment at the exhibition.

The Equipment Exhibit was an unusual phenomenon. Originally, 92 booths were available. But because of the strong demand for space, and the ability of Exhibit Chairman Warren Strang to squeeze out a little extra space here and a little extra space there, 96 booths were sold. At that, several companies could not be accommodated owing to the limitations of the exhibit area at the Century Plaza.

This is where the SMPTE publicly acknowledges the contributions of those local committeemen who put together the Conference. Though no words of gratitude can adequately compensate these people for their time and efforts, the Society nevertheless thanks the local committees, both Program and Arrangements, for their work in giving the Society a Conference it can be proud of and which it can now turn to as the standard of excellence that should be the goal of all future Conferences.

A large amount of interest in the Conference was generated by the technical papers program hammered out by Program Chairman Fred Scobey, DeLuxe General, and his Program Committee. The Program Committee deserves praise because not only was there an unusual number of interesting papers, but the overall quality, according to early evaluations, seems remarkably high. This augers well for future issues of the SMPTE *Journal*, a publication that relies heavily on papers presented at the Conference.

Assisting Scobey as Associate Program Chairman was Julian Hopkinson, Agfa-Gevaert. The Topic Chairmen, whose names follow, were responsible for obtaining papers in specific topic areas. Each one did his job with diligence and imagination. The Topic Chairmen were: *Sound,* Petro Vlahos, AMPTP Research Center; *Theater Presentation and Projection Practices,* Don V. Kloepfel, DeLuxe General; *Laboratory Practices,* Roderick T. Ryan, Eastman Kodak Co.; *Videodisc Systems,* Robert Kreiman, DeLuxe General; *Television,* Bob Ringer, Image Transform; *Energy Crisis and Conservation,* William D. Hedden; Calvin Communications; *Studio Production Practices,* Pete Clark, AMPTP Research Center; *Safety and the Motion-Picture and Television Industry,* David Degenkolb, DeLuxe General; and *Small-Format Film Systems,* Edwin Levinson, Inflight Motion Pictures.

The Arrangements Committee was headed by Robert Gustafson, Consolidated Film Industries. Assisting him as Assistant Local Arrangements Chairmen were John Lakotas, Eastman Kodak Co., and Harold Hinkle, Movielab.

The Equipment Exhibit Chairman was Warren Strang, Hollywood Film Co., Russell Dubes was Auditor, Jack Leahy, RCA, was Banquet Chairman, and Carleton Wright, Agfa-Gevaert, and Ken Erhart, NBC, were Hospitality Co-Chairmen. The Hotel and Motel Arrangements Chairman was Ed Burns, Eastman Kodak Co.; the Ladies Program Co-Chairladies were Mrs. Fred Scobey and Mrs. Don Kloepfel; the Luncheon Chairman was Walter Eggers, MGM Labs; and the Membership Co-Chairmen were Ned Whiting, 3M Co., and Marvin Jacobs.

Eugene Murphy, Eastman Kodak Co., was Registration Chairman; Phil Singer, Agfa-Gevaert, was Opening Films Chairman, and Don Kloepfel, DeLuxe General, was Projection Chairman.

C. Carroll Adams III, C. Carroll Adams Enterprises, was Public Address and Recording Chairman, Harry Lehman was Publicity Chairman; Scott Robertson, Eastman Kodak Co., was Transportation Chairman, and Wilton R. Holm, was Foreign Delegations Chairman.

The Program Committee was under the jurisdiction of SMPTE Editorial Vice-President Gerald G. Graham, National Film Board of Canada. The Arrangements Committee was under the supervision of Conference Vice-President Harry Teitelbaum, Hollywood Film Co.

Get-Together Luncheon

Pinch-hitting for SMPTE President Byron Roudabush, who could not attend the Conference because of illness, SMPTE Executive Vice-President Kenneth M. Mason, Eastman Kodak Co., presided at the luncheon. Mason, who preceded his remarks with regrets that Roudabush could not attend, introduced the dignitaries seated at the dais, which included SMPTE officers, Conference Chairmen, foreign visitors, SMPTE Past Presidents and other guests. Mason then introduced Roland K. Zavada, Eastman Kodak Co., who described the upcoming Symposium, to be held at the Toronto Conference this fall, on Program Identification Systems. Past President Wilton R. Holm, AMPTP, then introduced the distinguished guest speaker, the well-known three-time Academy Award-winning film director Frank Capra.

Executive Vice President Kenneth M. Mason addressing the SMPTE at the Get-Together Luncheon.

Remarks of Kenneth M. Mason

"You know, you never really miss someone until he or she isn't there—and believe me, right now I miss good old Byron Roudabush. Seriously, we're all sorry Byron can't be with us today, but I'm glad to report that Byron is recuperating nicely in Florida and sends his best wishes. There was also something said about a 42 for nine holes. On behalf of Byron and the Board of Governors, I extend a hearty welcome to this, the 115th Technical Conference of the SMPTE.

"Personally, I feel the value of coming together like this to exchange ideas, sample new techniques, and investigate new equipment can't be overestimated. Since 1916, of course, our membership has been gathering regularly to become personally and individually acquainted with the people, the new systems, and the new technology that will continue to make SMPTE history . . . resulting in important contributions to the strengths and standards of the motion-picture and television industries.

"Certainly, I think we can all look forward to five days of hard work, lively learning, and rich rewards here at our Hollywood conference. I don't want to suggest that everything you'll see or hear this week is destined to be revolutionary or earth-shaking but I know you'll find it right for the work you're doing today, and relevant for tomorrow. It's gatherings like this—groups like this—that keep me optimistic about the direction of our industry. Because all of you out there are responsible for making sure that this industry keeps growing and, to borrow an almost perfect phrase left to us by Louis B. Mayer, 'spreading like wildflowers.'

". . . Here at our 115th SMPTE Conference, we all share the responsibility for developing our product—technological advances—and that product is the imperative of SMPTE . . . . [The Society's] rich history of advances has been an accrual of results which were influenced, if not initiated, by especial outlooks and attitudes which were able to turn innovation into opportunity. And that's what this conference is all about — opportunity. Each and every one of us has an opportunity these five days to ask . . . analyze . . . and achieve.

"Since we ordinarily have but two opportunities each year to get together, I think it would be appropriate to take just a moment to tell you about things that are going on inside SMPTE. We acquired our own headquarters in Scarsdale, New York about two years ago, and I am pleased to tell you this operation is working out quite well. We now invest in our own building instead of paying rent, and Denis Courtney tells me the internal operation is much more effective. Anyone visiting New York and wishing to call at SMPTE headquarters will find very convenient transportation every half hour out of Grand Central. It is a 20-minute trip.

"There has been a lot of conversation for many years about the Society's policy on Conferences. Ever since the beginning of such affairs, two of these have been held each year. For many reasons that I won't go into now, there is growing sentiment to hold only one Conference a year. I can tell you at this moment that the Board of Governors is looking very favorably at this proposal and, if proper arrangements can be made, we will begin one Conference a year starting no later than 1976. There are problems associated with only one Conference, such as the possible financial implications, adequate editorial support for the *Journal*, and service to members. These areas will be closely watched. At the same time every effort will be made to expand regional meetings and two or three-day seminars which can be held in locations other than the large metropolitan cities. In this way, we anticipate improving service to members and also hope that good material can be derived for the *Journal*.

"I also take pleasure in announcing the SMPTE Scholarship Awards for the year 1974-75. The Society is greatly indebted to the Academy of Motion Picture Arts and Sciences for its generous support of this highly significant program. The winners are:

Jerry A. Covey—Rochester Institute of Technology

Michael D. Klein—Rochester Institute of Technology

Roland J. Zavada describing the proposed symposium to be held at the Toronto Conference.

Past President Wilton R. Holm introducing Frank Capra, the Guest Speaker.

Martin Greenfield—University of Rochester

Svetlana Ho-Do-Ley—Rochester Institute of Technology

Pamala Karol—Loyola College, Los Angeles

Sheryl Kirschner—University of Southern California

"At this point, before closing, I'd like to recall to you a remark made by Mr. Walter Fallon in his address to this group last year. As many of you will remember, Mr. Fallon made reference to opportunities coming to call—opportunities masquerading as problems. Well, we're going to be faced with many problems during this conference. As we meet these problems, let's keep in mind that our organization has a long record on contributions and achievements—a 57-year record of unmasking problems to reveal the challenge of opportunity.

"A famous historian once wrote that 'the winds and waves are always on the side of the ablest navigators.' I think that's a fitting expression of our outlook as members of the SMPTE. As a partnership of technical expertise, understanding, and imagination, we can be confident of success and proud of our progress. It is my sincere wish that after this conference is over, we can each honestly say that our efforts and our judgments here have further contributed to the rich history of our august Society. Thank you."

Remarks of Frank Capra

"Ladies and Gentlemen, I suppose I'm here today because of engineering. At least because of a little knick-knack of engineering.

"During my chemical engineering studies at Cal Tech, I had learned a heck of a lot about Avogadro's Law, and Boyle's Law, and Ohm's Law. But all the learned laws of science put together couldn't buy me a cup of coffee during the no-job depression that followed World War One when some of us, still in uniform, sold apples on street corners, and lived on the Salvation Army's doughnuts.

"Ah, but never underestimate the power of technical information, be it every so picayune. For while escorting a newsreel cameraman around Caltech, I asked him how many minutes of film he had in his magazine. He said, 'Kid, that's a riddle. I can give you the answer *exactly* in seconds, but *not* exactly in *minutes.*'

" 'Why not?'

" 'Because 400 feet of film, running through at one-foot-per-second, means 400 seconds, right? But if you want the answer in minutes, you divide 400 seconds by 60, and what do you get? Six point six, six, six, and add six, till-you're-blue-in-the-face *minutes.* Got it, kid?'

" 'Yeah! Oh, wait'll my roommate hears I've discovered another irrational number, like Pi, or the logarithm base 'e'. He'll flip when I tell him the film *load* (400 feet), divided by the film *speed* (60 feet-per-minute) equals the *irrational number* 6.666 add 6 till-you're-blue-in-the-face *minutes.*'

"Well, believe it or not, remembering that seemingly useless bit of information, was to become, for me, more important than remembering the great Laws of Euclid, Newton, Einstein . . . or Sid Solow. For it was on one of San Francisco's cold, foggy, January mornings, in 1922, after I had been unceremoniously thrown out of a parking garage, for sleeping in one of its cars, that a piddling scrap of knowledge about a film magazine, was to completely change my whole life.

"Cold, broke, hungry, down-in-the-mouth, I set out, that foggy January morning, for Golden Gate Park and a Jewish Gymnasium. I'd read in the papers that a local company was going to make movies there. What did I know about movies? Nothing. But maybe they'd need a janitor, or a driver, or something. Anything.

"I entered the large cavernous gymnasium, and by the harsh light of a naked burning bulb set on a stake, I saw a large square man, in a large black overcoat, pacing back and forth, rehearsing a speech.

" 'Hello, sir!' I called. He slowly and dramatically raised a hand over his eyes, trying to find me in the dark.

" 'You have the advantage of me, sir,' he answered, in a deep rolling basso, the kind that flutters candle flames. 'Are you from the Press? It's quiet here today. Jewish holiday.'

" 'Oh, no sir,' I said. 'I'm from Hollywood.' So what's a little lie if you haven't got to eat? But the effect on him could not have been more startling had I said, 'I am the Bishop of Canterbury.'

" 'Holly-wood!' he rolled out. 'Well, well, well! I've never met anyone from the film Mecca.' I felt like answering, 'That makes two of us, buster.' But I didn't.

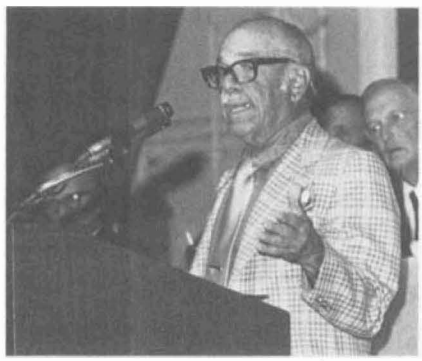
" 'You may approach me, sir,' he beckoned, regally. 'I am Walter Montague. You may have heard of me. In vaudeville. I headline in Shakespeare.' We shook hands. And in that cold, empty building, trading cliches over coffee and cake with that seedy Shakespearean ham, I got the sickening feeling he had as much money in *his* frayed pockets as I had in mine. Which was zero. Well, better have some more of his cake, and slip him a nudge about money, and get it over with.

" 'Mr. Montague, I'm dying of curiosity. How much will your — uh first opus cost?'

" 'Well, my dear fellow,' he answered, clawing an aspirin out of a pill box, 'though I say it myself, I have few peers in my field of short dramatic skits: Shakespeare, Chekhov, Poe. But recently business friends of mine have urged me to widen my scope, transfer my talents from *vaudeville* to the *world screen,* and they would finance me.'

"The word 'finance' raised some hopes.

" 'Well, sir,' he went on orating, 'the daring of this conceit obsessed me like heady wine. 'Walter Montague,' I asked myself, 'is this a dream of fools? Or, can you, at your age, express your artistry in a *new* medium?'



Frank Capra addressing the Conference.

" 'Walter,' my inner voice cried, 'the cinema is *not* a new medium. What difference if the performing arts are seen through the many eyes of the *audience,* or through the single peephole of a *camera?* It is still THEATER!' Is it not, Mr. Capra?' his fierce black eyes taking a bead on me over his aiming finger.

" 'Sir, I'm fascinated. But — uh in Hollywood the dough-re-me is our number one headache. Are you *fully* financed?'

" 'Young man,' he said, drawing his head back to better look down his nose, 'the funds are in the bank awaiting the stroke of my pen!'

" 'Congratulations!' I exclaimed, beginning to sense paydirt.

"He bowed, and said, 'You are very kind. And so, the muses being kinder still, I have chanced upon what may become a *new form* of film art. From the great treasure trove of classic poems, choose the most dramatic. Compress each poem into ten minutes of action a one-reeler you call it? Yes. And use the golden verses as titles superimposed over the action. Are you following me, sir?'

" 'Oh, yes. Thrilling. But tell me, Mr. Montague. Have you ever *made* a film?'

"His coffee cup rattled as he set it down. I'd struck an exposed nerve. 'No-o-o-, I haven't. But I mean to innovate, young man, not ape. In Hollywood you move the camera, but not the actors. That is wrong! Does the man in the aisle seat in the second row hop around during a whole performance? NO! And neither should the camera. I will nail my camera down in one spot, and my actors will perform the ten-minute poem without a break. And the camera will *photograph* the complete performance, just as the man in the orchestra seat would be *seeing* the complete performance.' He stopped to impale me with a sharp look. 'Anything wrong with *that,* my young Hollywood friend?'

"Well here comes science charging over the hill to my rescue. I remembered that bit of technical trivia I had picked up at Cal Tech. Odd how many ways an education, any kind of education, comes in handy.

" 'Mr. Montague,' I said, keeping my cool. 'I hate to say it, but there is something *very* wrong with your new technique.'

" 'There is?' he asked, visibly sagging.

" 'Yes. It will be impossible for your actors to perform continuously for *ten minutes . . .*'

" 'Impossible? I've done it innumerable '

" 'Not you, sir, not you. The camera. The camera is limited by this rigid mathematical equation: The film *load* (400 feet), divided by the film *speed* (60 feet per minute), gives you six point six, six, six, add six till you're-blue-in-the-face film *minutes!* An irrational number, as you know, but still far fewer minutes than the ten you require, sir.'

"He sat down heavily, clawing his pill box for another aspirin. I had him on the ropes. Another flurry of scientific jargon should finish him. 'You see, Mr. Montague, if you nail the camera down, and have to replenish it with film every few minutes, the actors must freeze in their positions, as rock steady as wax figures for the time it takes to refill the camera. A physical impossibility. So the camera must be *moved.* And the lights must be *moved,* according to precise mathematical equations, because the density of the light from the actor's face to the camera varies as the square of the distance, and . . . but Oh, I'm wasting your time, Mr. Montague . . . I wish you luck, sir.'

"He just stared at me. I waved and turned to go. This was the moment of truth. If he let me walk out that door, I'd had it. As a possible excuse for a reentry, I had left my folded newspaper on his desk. I reached the door. Faced the wrong way as a delaying action, then turned and started out.

" 'Sir!" his voice boomed out. I came back to the doorway. 'Young man. Would you consider, I mean just between us, could you find time to help me plan this first picture?'

"Great day in the morning! I thought he'd never ask.

"And that's how one picayune bit of technical information catapulted me out of my familiar world of science and into the unknown world of film.

"The night of October 6, 1927, at the Warner Theater in New York, was a night to remember. Why? Because Al Jolson's shadow sang from the silver screen that night. The sound waves of 'Mammy' were as devastating as seismic waves. A major earthquake rocked the film world. The screen had grown a larynx! Hollywood shook!

"Volumes could be written about the comedy and the tragedy of sound; the careers it destroyed and those it made. For one thing, it killed pantomine just as it was flowering into a great art. It ended the life-work of Chaplin, Lloyd, Keaton, Semon, and many other pantomine artists.

"Mayer, Schenck, Laemmle, Zukor, Fox, Goldwyn, listened with the awe of children to such ominous words as decibels, microphones, light waves, soundtracks. Frantic theater owners ripped open their rococo walls to install mare's nests of black cables and blacker squawk boxes. Damn those Warner brothers with their goddam talkies.

"In it's helplessness, Hollywood pleaded for aid from the institution it had nearly demolished, the stage. As if speech had been newly discovered, all actors' voices had to drip with pear-shaped tones. The engineers said so, and they ran the show.

"The ridiculous, useless tragedy of all this childish panic was typified by the sad case of John Gilbert, the most popular box-office male star of the time. Engineers gave him voice tests. He flunked, they said: voice too high, too nasal, or something. The cowed MGM executives gulped, but they obeyed the ruling. Their box-office bonanza was sacrificed on the altar of ignorance. In despair, John Gilbert went on a prolonged drunk, sat out his $10,000 a week contract—and died.

"How did my boss, Harry Cohn, take to sound? It scared his pants off. We had many conversations on the subject.

" 'Frank, New York says we gotta make all talkies now. Tell me. You're a Caltech graduate. What the hell is all this sound crap *about?*'

" 'Harry, it's the biggest thing to hit movies since *The Great Train Robbery*. Wait and see."

" 'Yeah, yeah. But I'm being asked to tear the joint apart, invest hundreds of G's in microphones, booms, cables, generators, sound booths, sound recorders. Jesus! I'm scared, Frank.'

" 'Harry, you're not afraid of a telephone, are you? Or of a plain camera? A sound recorder is just another *camera*. It photographs sound waves from your voice, just as an ordinary camera photographs light waves from your face.'

" 'Come on! I can *see* my face. How can you photograph my voice, which I can't see?'

" 'Its a little more complicated, Harry, but not much. Anyway, don't worry about it. Just get yourself a top sound man And how about my next picture being a talkie — or a half-talkie?'

"As you might infer from my conversations with Cohn, sound had no particular terror for me because, paradoxically, what you know *well* doesn't frighten, and that about which you know nothing at *all* doesn't frighten, either. The least worried are the knowledgeable and the ignorant. I knew sound, but was blithely ignorant of directing stage actors speaking dialogue. So I feared neither.

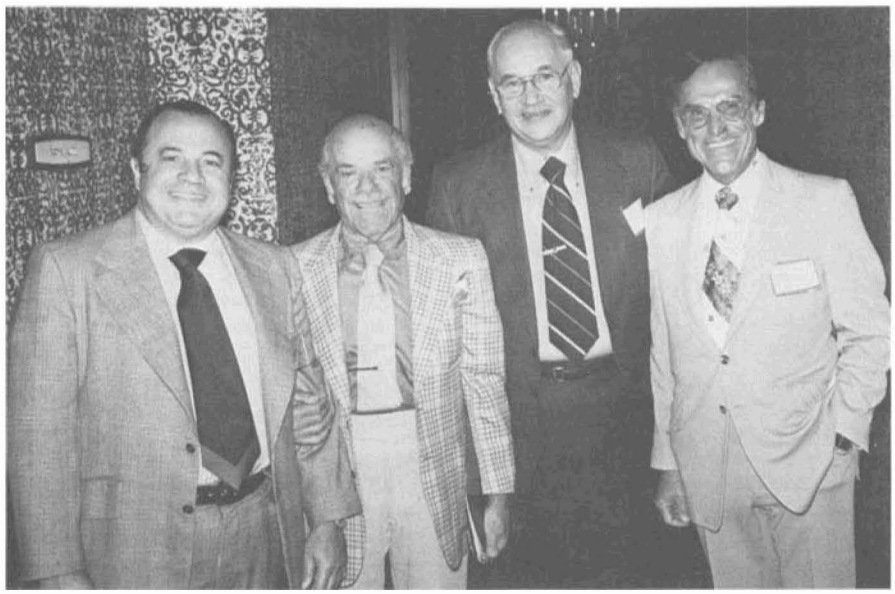
"Well, with a fine cast: Jean Hersholt, Ricardo Cortez, Lena Basquette, and Rosa Rosanova, I made Fanny Hurst's play, about a social-climbing super-Jew who denied his parents, into a half-talkie film. We called it *The Younger Generation*. The first half we shot silent at Columbia, the second half in sound at a 'sound stage' on Santa Monica Blvd., somewhere.

"While many big shots mulled about sound, or tried exorcising it with incantations of 'fad!', 'gimmick!', 'won't sell!', some sharpie wangled priorities in sound equipment, hung horse blankets on the walls of a 'barn,' and had himself a rental sound stage, with customers waiting in line.

"Well, shooting my first sound picture was an etude in chaos. First of all, no one was used to being quiet. Shooting of silent scenes had gone on with hammering and sawing on adjacent sets, the director yelling at actors through a megaphone, cameramen shouting 'Dim the overheads! . . . Grips! . . . Slower on the dolly!' while everybody howled if the scene was funny.

"My first sound cameraman was Ben Reynolds, a 5½ foot, 300 pound veteran of silent films. He looked like a whiskey barrel walking on two fire plugs. One shouldn't expect to see a *neck* on that build, but it *was* startling not to see his *ears*.

"Ben could sleep upright sitting on a stool, which he did regularly for ten-second intervals while you talked to him, after which he would open his eyes and ask 'What'd you say?' Well, it took two huskies to shove Ben into the airless booth and sit him next to his camera, but it took half a dozen to pull him out. As soon as his booth was barred shut, and the start-camera bell rang, Ben went peacefully to sleep. It didn't matter much to the scene because his camera was pre-set and locked into position. But it meant Ben's life to get him out in a hurry at the *end* of the scene, and snatching 300 pounds of limp, stuck flesh out of that hot box wasn't easy. After much fanning, Ben would open his eyes and say 'All right, fellas, I'm ready. Let's shoot the scene.'



SMPTE Conference Vice President Harry Teitelbaum, Frank Capra, SMPTE Past President Wilton R. Holm, and Registration Chairman Eugene Murphy.

Now, with sound, all of a sudden we had to work in the silence of a tomb. When the red lights went on, everyone froze in his tracks — a cough or a belch would wreck the scene. It was like a quick switch from a bleacher seat at Ebbett's Field to a box seat at a Wimbledon tennis match.

"Then there were the cameras, which now were unusable with sound, because they whirred like ancient sewing machines, some rat-tat-tatted like the pieces of cardboard kids fixed against the spokes of their bicycle wheels.

"To kill the camera noises, our wonderful mobile, moving cameras were mummified and entombed in thick padded booths, a sound-proof window in the front, a padded door in the back. Of course, the cameraman was stuffed into the booth *with* his camera, and, of course, he couldn't hear a blessed thing about what was going on outside. But who cared about hearing when he was suffocating? There was more air inside the cameraman's lungs than there was in the booth. A two-minute stay in that padded vault and he was ready for the oxygen tent.

"Then, too, there were the hellish, hot lights, with sound making them doubly hot. Silent films ran through the cameras, and projectors, at a speed of 16 frames per second; actors on the screen moved normally. But sound-track film was speeded up to *24* frames per second through the recorders. That meant *camera* film had to run at 24 frames through the synchronized cameras, 50 percent faster than in silent movies. (That is why old silent films, shot at 16 frames per second, but today projected at 24 frames, look so fast and jerky). But speeding up the film demanded about twice as much light exposure on the actors, which generally meant about three times as much heat. Well, the poor actors just melted. Sweat-soaked clothes were changed almost hourly.

"But these were small annoyances. The *big* gremlin was the new Wizard of Oz, with his

awesome ear-phones plugged into black boxes of magic, the *sound* man. Our sound man *seemed* to be a level-headed, non-flappable technician, that is, until he started twiddling the dials on his mixing panel during a scene. Then he became unsoldered. Time after time, during a scene, he would push the 'cut' bellbutton, then rush in to bawl out the actors.

" 'No! No! No! How many times do I have to tell you, Mister Hersholt. You've got to talk directly into this mike in the flower pot. You can't turn away and look at Mister Cortez while you're talking. And you can't talk *between* this mike and the one hidden in the desk drawer until you *get there*. . . . Can't you understand English?' At first I tried to reason with him — then I had to lower the boom.

Sid Solow and Ken Mason enjoy a few moments with Guest Speaker Frank Capra after the Get-Together Luncheon.

" 'See here, sound man. Don't you dare stop another scene unless I tell you to. And don't *ever* walk into that set and talk to actors. Is that understood?'

" 'But you don't want bad *sound*, do you?'

" 'I've got a bigger 'don't want' — bad *scenes*. Now, you'll solve your problem if you keep all the mikes open.'

" 'But there'll be echos, reverberations, the manual says so.'

" 'Not enough to matter. Just *try* it my way. Keep all mikes open, set all the dials, then keep your fingers *off* of them.'

" 'But I've *got* to use the dials—to lower the loud words and bring up the soft ones.'

" 'No, that's the *last*—never mind. Let's take the scene.'

"Slowly, link by link, chain by chain, the shackles of sound that had set back filmmaking 30 years were removed. Eastman Kodak researchers came up with faster emulsions needing far less light. The actors were freed from unbearable heat. The cumbersome microphones hidden all over the set, with dead spots in between, were replaced with one sensitive mike on the end of an overhead boom, which followed actors everywhere, freeing them from static immobility. The Mitchell Camera people made a "silent" camera usable *outside* that prehistoric "fixed" monstrosity, the camera booth. May it rust in pieces. Once more the camera was free as a bird; and Ben Reynolds was not doomed to drown in his own air.

"And, it certainly freed the director. When the kinks were ironed out, sound gave him the additional, magnificent tools of dialogue, sound effects, and *music!* Now we could put our *own* music on the picture sound track rather than depend on the random, "individual scoring" of eccentric organ players, player-pianos, or barroom ivory ticklers.

"Selecting background music for the first time was a thrilling forward step. Just one year and seven pictures before that I had been a discouraged two-time "loser" back in Sennett's Tower. Now, I was putting the haunting themes from Anton Dvořák's *New World Symphony* into a talking picture, which, by the way, I think we "stole" from a symphonic record. For me, sound was lagniappe from the Three Princes of Serendip. But what was sound to be for my old boss Mack Sennett?

"Well, when the old Napoleon of the bed-slat got hit with "Talkin' Mike's" big one-two, he staggered, but didn't fall. He hung on, hoping for a draw. He hocked his valuables, built a new sound studio in the Valley, discovered Bing Crosby, and began making excellent two-reel "talking comedies" with Bing and the great W. C. Fields. Even when the Stock Market crash knocked him off his feet for the first time, he got up at the count of nine, bloody, but full of fight.

"Then, someone opened an ink bottle, and out came a powerful genie, the animated cartoon! What sound or Wall Street couldn't do, the cartoon did. Sennett took the full count of ten lying on his back. Audiences raised the cartoon's hand as the new Champ of Comedy. The King never got up again.

"In his delightful book about Mack Sennett, Gene Fowler said finis to the Golden Age of Comedy in two cryptic lines:

Who killed Cock Robin?
"I did," said Mickey Mouse.

"It was *sound* that made Disney's wizardry possible. What Gutenberg's printing press did for the written word in the 15th century, sound did for the spoken word in the 20th century: actors' voices, music, and sound "effects" were stored or "canned" on film emulsions, later on magnetic tape, to be recalled and reproduced at will for hundreds of millions in the world's movie theaters.

"And just as Gutenberg's simple but enormously fruitful idea, carving alphabet letters on the ends of separate wooden blocks, arranging them into words, brushing them with ink, and pressing them on paper, opened the floodgates to the creative rivers of literature, enriching parched minds with beauty, knowledge and fertile concepts, so did a little sound "gimmick," the light valve, prove to be Aladdin's lamp to films. We rubbed it, and presto! The arts of spoken drama, music and dancing, and the fantasies of animated spectacles were available in the remotest hamlets for less than one paid for a package of cigarettes.

"Within a few years after sound dropped its bomb on Hollywood, some fifty "musicals" per year set the world to humming tunes and tapping feet; feature "talkies," at a rate of better than one a day, wrung, tickled, or prodded emotions from Nome to Naples. And sound sprouted some astonishing off-shoots: cartoons, news, propaganda. Statesmen argued the fate of nations in newsreels; Hitler spouted his hymns of hate. The voice of film was heard round the world, but its tongue split into many forks. One of these forks was later to become my pet prod —social satire.

"And now, ladies and gentlemen, in closing, I want to personally thank and congratulate those great magicians of Hollywood, the technicians. Without the invention and the creation of that wondrous third dimension of sound, which when added to the other two dimensions of sight and movement, opened up *new* creative worlds to filmmakers, it is doubtful whether the so-called Golden Age of films of the '30's and '40's could have flourished.

"And, as a postscript to that remark, I think the real Golden Age of films is yet to come. It will come when the young of today, who are practicing their scales with their little cameras even in the grade schools, begin to create directly for the screens in the greatest art form ever imagined, FILM! Thank you, ladies and gentlemen."

Program Highlights

MONDAY

Laboratory Practices I

Aquarium-Gate Retrofitting of Optical Printers (Carter & Mueller) deals with yet another manufacturer's approach to the design and manufacture of an aquarium-gate retrofit for optical printers using removable movements, such as those marketed by Producers Service, Research Products and Oxberry. Also described in detail is the design and construction aspects of a gate to be used in conjunction with Depue optical printers, which, due to their unique construction, have heretofore not lent themselves to such modifications. Solvent-circulating system, film-drying techniques, materials of construction, and optical design are dealt with in detail for both of the aquarium gates in this paper.

A Kit to Improve the Efficiency of Existing Model "C" Printers in the Laboratory (Wohlrab) describes the new features obtained when using the kit. The procedure involved in installing the kit is outlined.

High-Resolution Graphics Using a HeCd Laser to Write on Kalvar Film (Berg, Cormier & Courtney-Pratt) describes a machine developed at Bell Laboratories to provide high-resolution graphics transmission capability in connection with their system for visual telephone service. A 1400-picture element by 2000-line image, with full gray scale, is transmitted over a 0.5-MHz line in 4 s, and developed in less than 1 s. Each machine is a transmitter-receiver capable of local copy. Applications, operating modes and results are presented.

Gevacolor Print Film Type 9.86 (Alliet, Seys & Verbrugghe) compared this film's characteristics to Gevacolor print film T 9.85. A major improvement in graininess has now been obtained; hence, type 9.86 will prove to be an especially suitable film for reduction printing to small formats. Type 9.86 can be developed together with other similar color print stocks in the standard processing sequence, based on a color

developer which has 2-amino-5-diethylaminotoluene monohydrochloride or CD2 developing agents.

A New Color Print Film With a Shortened Processing Sequence (Baptista, Bonheyo, O'Connell, Schafer & Knutsen) summarizes the developing sequence and times of the Eastman Process ECP-2, which has a 10-min wet time and provides an efficient means of processing color release prints. A new print film that will work well in this higher-temperature developer is Eastman Color SP Print Film 5383 and 7383. The new film gives screen performance results comparable to Eastman Color Print Film 5381 and 7381.

Super-8 Continuous Optical Reduction Printing With Simultaneous Magnetic Sound Transfer (Wary) considers the parameters needed in the design of a COR printer which performs both picture printing and soundtrack recording in a single pass through the printer. The control of the magnetic transfer is automated at every point possible. The dropout detection circuits are not allowed to stop the printer but only to signal an alarm and light a light to indicate a dropout had occurred. Bi-directional features include two sets of record heads. Electromagnetic clutches are used to provide smooth acceleration and deceleration of flywheels and impedance drum assemblies. Frequency response of the system is 10× real speed allowing printing to be done at 360 ft/min (110 m/min). The ability to A-B master 16mm track with the newly recorded super-8 track is provided.

Energy Crisis & Conservation

The Energy Crisis (Holm) outlines the problems and dilemmas surrounding our current energy crisis. "The goal of self-sufficiency by 1980 will not be attained unless we become concerned about energy demand as well as energy supply. We must hold down consumption and also reduce the per capita growth rate of consumption."

Practical Applications for the Recycling of Processing Solutions Used in Motion-Picture Developing Machines (Smith) discusses the reduction of chemical wastes, concentration limits of replenishers, mechanical changes, staff requirements, precautions to observe and monetary benefits.

Monitoring the Processing Effluents of a Motion-Picture Processing Laboratory (Degenkolb & Scobey) discusses a computerized system for determining the efficiency of the operation of the chemicals departments at DeLuxe General Inc. A monthly report is produced that shows the BOD_5 contribution of each solution based on actual use and compared to our internal standards. The reports show the actual and aim use of each chemical. The actual cost of the chemical compared to the standard cost and the actual BOD_5 compared to the lab's standard. The BOD_5 of each chemical is totaled and divided by the water consumption to provide a realistic BOD_5 of the laboratory's discharge. This technique has been in use for over a year, and the accuracy has been validated by independent laboratory analysis.

Energy Conservation Measures for Film Processing Laboratories (Bishop & Grigsby) explores a range of specific conservation methods — both simple and sophisticated — in areas of lighting, climate control, equipment operation, and employee support and involvement. Suggested methods are based on experiences of Kodak processing laboratories.

Minimizing the Impact of Chemical Shortage by Substitution, Reconstitution and Reuse of Chemicals Consistent With Pollution Abatement (Hendrickson & Claprood) describes chemical shortages as a result of the energy crisis with specific emphasis on those chemicals used in the motion-picture film processing industry. Methods of chemical substitution and chemical recovery, which lessen the effort of the reported or anticipated shortages, are discussed from an economical and technical point of view.

The Energy Crisis: Improvements, Imperatives, and Ideals — A Photographic Products Manufacturer's A, B, C's (Christian) reviews, from the standpoint of a manufacturer of raw stock, the chronology and significance of the anti-pollution legislation. Examples of the actions that one manufacturer of photographic film has taken in order to improve the environmental impact of its operations are given.

A New Method for Cyclorama Lighting (Bonsignore & Glenn) describes a new cyclorama lighting system which uses fluorescent light sources with specially chosen phosphor and trimming filters to provide three independently controlled primary colors that match the primaries used in studio cameras very closely. The design of the reflector optics used to achieve the uniform distribution at high efficiency is described.

The booth in the registration area promoting the 116th Conference in Toronto.

TUESDAY

Sound

ST-8: A New Agfa-Gevaert Sound Negative Film Especially Suitable for Small Formats (Staes, Hayen & Verbrugghe) announces the availability of a new film intended to improve the quality of optical sound in all formats, especially in super 8. Using an orthochromatic sensitization, a higher sensitivity is obtained with better optical characteristics such as sharpness and graininess; processing is in a conventional phenidone-hydroquinone developer. The results obtained, after printing on Gevacolor print film type 9.85, are discussed for 35mm, 16mm and super-8 formats.

Film Consoles: The New Technology (Bennett & Windsor) outlines how advanced electronic technology can relieve the sound mixer from routine and purely mechanical functions, freeing him to concentrate on the creative and artistic aspects of his work.

A High-Speed Interlock System for Re-Recording (Briel & Dickinson) provides a means of operating an interlocked system at high speeds, forward or reverse. The system under discussion consists of a 35mm high-speed projector, 35mm magnetic film recorder and 35mm dual magnetic reproducers, a multi-speed interlock system, and associated electronics. Designed into the system is capability of operating in either a manual or a pre-set automatic mode, and the approach used to achieve this requirement is outlined.

High-Speed Recording System (Prisament) consists of 16mm or 35mm projectors, magnetic reproducers, magnetic recorders, and footage counter; it permits operating a sound mix or post sync recording session, forward and reverse in electrical interlock, at sync, 3× and 6× speed.

A Wide-Range, Noise-Immune, Three-Channel, Variable-Density, Push-Pull, Color Photographic Soundtrack for Motion Pictures (Vlahos) outlines a project to develop a three-channel soundtrack with flat frequency response to 12 kHz, a track that would be immune to the effects of dirt and scratches, and provide a clean signal essentially free of distortion. The principle difference in this method of sound recording and reproducing is in the method of

employing photographic film. Heretofore, the stored signal on the film was read out as a transmission of light through the film. In the superimposed push-pull method, the stored information is read out as a color ratio that is essentially independent of film area or of film density. In effect, a frequency modulation is read, in which the frequency being modulated is that of the color of the light.

Modification of the Westrex RA-1238 Light Valve and Photographic Recorder for Recording a Color Push-Pull, Three-Channel Soundtrack (Pontius) discusses the method of producing three .030-in-wide (.76-mm) soundtracks using the red- and green-sensitive emulsion layers in push-pull, with the half-cycles superimposed rather than side-by-side. Lamp tests, quality control tests, interlock system, and masking are discussed. The next generation of recorders is outlined.

System Characteristics and Audio Signal Processing for Color Push-Pull Three-Channel Soundtrack (Reitz, Jr.) summarizes the system characteristics of the three-channel soundtrack described above.

Demonstration of the Color Push-Pull Three Channel Soundtrack (Vlahos) was held at the ABC Cinema II Theater across the street from the Century Plaza Hotel.

Laboratory Practices II

A New Electronic Color Video Analyzer (Carter & Jones) describes not only the operation and film transports, but also the various methods of operation when used in conjunction with peripheral equipment such as automatic data storage systems, computerized tape punches, hard-copy printers and standard tape punches. Considerations for both negative/positive and reversal operation are given and comparative data are furnished regarding unit reliability, repeatability and actual film-test correlations.

A Proof-Print System for Motion-Picture Timing (Sokolow & Reichard) announces a system for preparing a single-frame "proof-print" from a fully edited negative, using previously determined timing which has been programmed into a conventional punched tape. This filmstrip is then viewed in a specially designed single-frame projector that matches in color-temperature and screen illumination the recommended specifications of a conventional motion-picture projection room. The timer can compare the frames and arrive at improvements in the programmed exposures, either for an additional proof print or for the actual full-length motion-picture print.

Technicleaner: A New Film-Cleaning Machine (Deer & Carter) deals with the construction and operation of third generation of Technicolor Inc.'s film-cleaning machines, built and marketed by Carter Equipment Co., Inc. Comparison slides are shown of cleaning efficiency of the Technicleaner and other commonly used film-cleaning machines.

A Unique System for Temperature Control of the ECN II Process (Friedman & Hempling) explains the fundamental concept of the system — to bring the liquid temperature to its set point in stages so the final control function acts only upon a small temperature differential. Positive control of heat input and removal is required; this is accomplished by use of separate-loop hot and cold exchangers which "buck" each other rather than mixing heat-exchanger mediums. Thermistor-type sensors are used; these are small-mass solid-state devices. Mounted in stainless steel or titanium housings they are immersed directly into the solution to give the essential close thermal coupling. The controllers are solid-state balanced-bridge design units. They are packaged in plug-in modular boxes. A front-mounted temperature set-point dial is provided. There is one controller for each heat exchanger. It drives an electric motor valve, which regulates the flow rate of the heat exchanger medium through the heat exchanger.

Angular-Velocity Suppressor for Film-Metering Application (Gyori & Scobey) outlines the requirements for the metering brake at the feed-in end of a high-speed processing machine. Since the requirement of such a device is that it meters film from zero feet per minute to maximum machine speed accurately, and also allows a fast accumulation of film in the elevator at maximum machine speed of 300 ft/min (90 m/min), no mechanical device could meet this requirement. The Angular Velocity Suppressor is an electromagnetic device, electronically excited, with a closed-loop servo system. It is capable of metering film of any format or reel size diameter from zero to 600 ft/min (180 m/min) with high accuracy and maintain constant tension of the film at all times.

Laboratory Slitting of Multi-Row Processed Film (Freeman) is a tutorial discussion of this laboratory operation which has long been of concern to the motion-picture industry. The author's experience would suggest that well maintained circular shear knives coupled with accurate guiding of the film should result in good width control. However, it is important to have a good technique for gauging the width, as not only the width but the variation in width is important.

Image-Converter Goggles For Darkroom Applications (Bracher) describes the operation of lightweight darkroom goggles for industrial use which enable the wearer to see up to a distance of 20 m (66 ft) in the dark. The main application of the goggles is for observing and supervising film-development processes in darkrooms.

A Compact Solid-State Printing-Machine Power Supply (Carter & DeVore) outlines the performance characteristics and the electronics of this new power supply. The unit features ac line regulation of ± 1/4% for line fluctuations on the order of ± 15 V. Also described in the paper are the CE-DVM-DC Digital Voltmeter, which may be used with any dc power supply with output voltages from 3 V to 130 V dc, and a similarly constructed Digital Tachometer.

Digital-Readout Cross Modulation Tester (Reitz & Whitmore, Jr.) gives the history, design parameters and method of operation of this equipment. It provides a direct readout in density deviation from an ideal print density and indicates whether it is over or under dense.

Studio Production Practices

The Burbank Studios — Concept to Reality (Hagel) defines the tasks necessary in forming a new, technologically modern, studio facility from two existing staffs and physical facilities. The results are outlined by the author: the first videotape capability in a major studio, the first record recording capability in conjunction with motion-picture or television scoring, and the first true ability for a creator to choose his media and work in any or all elements of that media within one single facility.

Conversion of The Burbank Studios Sound Stage 2 for Video Production (Glickman) summarizes the key design elements selected for the Burbank Studios to achieve a stage on which it would be possible to undertake the full range of television programming currently being undertaken in the largest and most sophisticated facilities that exist in this country.

A New Motion-Picture Studio at the Kodak Research Laboratories (Kage) describes the new Research Studios which serve Eastman Kodak as a production, testing and product evaluation area. Every effort is made to handle the new products in the same manner as the commercial, industrial and professional photographer only under very carefully controlled and measured conditions. Of particular note is a smaller studio room where the lighting can be changed from 2200 K to 5500 K; it is used for new emulsion sensitivity trials.

Metallogen — The New Daylight Light Source (Block, McGovern & Lemons) reports on the recent development by Osram of the Metallogen lamp family which provides a major step toward the goal of a full-spectrum, compact, highly efficient source of illumination. The Metallogen lamp output is a combination of the spectral power distribution of seven elements. Their smooth spectrum is a result of the use of rare-earth iodides. The resultant output has a color-rendering index of over 90 which makes it a near perfect source of daylight-quality illumination. The lamp also produces very little infrared which is beneficial for many applications, and its output of ultraviolet energy is similar to that of xenon lamps. The Metallogen lamp was initially developed for the lighting of remote pickups for German television. The high efficiency, daylight quality, compact size, ease of ballasting and rugged construction make them ideal for this service.

Re-Evaluation of Existing Motion-Picture Equipment (Forman) evaluates the individual elements of equipment required in motion-picture film production. Specific analysis is made of camera development, lighting equipment, sound equipment, and related accessories. In addition, the paper evaluates the total system of film production, indicating faults in equipment compatibility as well as voids in the total system of filmmaking.

WEDNESDAY

Small-Format Film Systems

The design of an Electronically Controlled Double Super-8 Camera for Professional Applications (Brown) introduces a new camera that utilizes Hall-Effect and other semiconductor technology in the major functional areas of exposure control, camera running speed, and sound synchronization. Five filming speeds may be independently preset within the range of 8 to 80 frames/s. Each speed is set by means of a small trimming potentiometer, accessible even with the camera loaded. One of the speeds is normally set for 24 frames/s (for the United States), at which speed the synchronizing generator produces a 60-Hz signal for use in double-system sound recording. Accessories extend the range to from one to 100 frames/s. An amplified Hall-Effect transducer is used in the generation of the sound synchronization signal. This results in an unusually pure sinusoidal signal for recording as a pilot tone on a magnetic tape recorder with a minimum of cross-talk. For synchronization with electronic flash units, either for single-frame or continuous filming, a glass-sealed reed contact is operated by a rotating magnet on the one-turn-per-frame shaft.

A Report of Measured Camera Noise of Some Super-8 Cameras (Conrad) presents some general comparisons and conclusions. The measurements were conducted on a B & K Real-Time ⅓-Octave Analyzer located at the University of Houston. Included in these measurements are several using a rudimentary barney to determine the amount of attenuation which may be achieved by external treatment of the camera body.

Reflections on the Development of Super-8 as a Professional Teaching Format. A Progress Report and Recommendations for Future Developments (Conrad) comments on the utility and ruggedness of "off-the-shelf" apparatus in use at the Rice University Media Center. The economics and utility of adapting and/or modifying existing equipment versus original design and manufacture is also considered.

A New Processor and Process for Super-8 Color Reversal Film (Borton, Jessop & McNair) explains how a new color reversal film, process and processor provide reliability and ease of installation for organizations wishing to make their own super-8 sound motion-pictures in-house, but not able to justify the technical expertise or effort required to operate more conventional processes. The new film, designated Kodak Ektachrome SM Film 7244 (Type A) is for super-8 applications. It has an exposure index of 160 for tungsten illumination.

A 200-Ft-Capacity Super-8 Cartridge-Loaded Sound Camera (Elle) reviews and illustrates the basic electrical and mechanical controls and sequencing of this single-system sound camera. A super-8 sound film recorded with the new camera is demonstrated.

Proposed Standards for 8mm Sound Film Projector in Education (Follis) recommends that standards be established and accepted for the important features of all 8mm sound projectors to be used in education. Without resolving conflicts concerning optical vs magnetic sound, and cassette or reel vs continuous-loop cartridges for film holders, the standardized packaging of films and their use with any projector cannot be realized. A group of concerned educators have suggested standards for a type of audiovisual equipment determined from the users point of view and their requirements.

Projection Practices & Theater Presentation

Communication — The Vital and Missing Link Between the Production and Exhibition of Motion-Pictures (Kloepfel) points out that many of the standards, innovations and improvements do not benefit the industry, and eventually the public, to the extent that they should, because of a lack of communication to the production people, the film technicians and the projectionists.

An Overview of Spherical-Motion-Picture Processes (Roberts) summarizes some of the optical and theatrical considerations involved. It is pointed out that the spherical screen can appear acceptably bright even when the measured illumination on the screen is less than would be acceptable on a flat screen. Some of the theories which attempt to account for this effect are presented. The paper concludes with a discussion of the audience; its seating and viewing angles.

A New Photometer for Measuring Screen Brightness (Walker & Branch) describes a new luminance meter which is particularly well-suited for routine screen-brightness measurements. The optical system is that of a "spot meter" with a 1° measuring field clearly defined within a large (21° diagonal) rectangular viewing field, for ease of locating the target area. The meter is visible in the viewfinder. The Spectra Mini-Spot measures luminance on either of two ranges (0–50 or 0–1000 fL; 0–170 or 0–3400 cd/m^2) with ±5% absolute accuracy and ±2% repeatability. The 0–50-fL scale is ideal for screen brightness measurements, providing excellent reading resolution between 1 and 30 fL (3.4 and 103 cd/m^2).

Optical Theaters for Displaying Visuals in Daylight (Scott) offers that new optical-imaging systems will reproduce high-fidelity color illustration in open sunlight. The only restriction is image size; if using standard lamps, and economical equipment, an image size of 20 × 26 in (51 × 66 cm) is maximum for outdoor use. The economics suggest that it is more practical to have several displays, rather than special and larger equipment, when dealing with large audiences; screen size, therefore, is not a real restriction. By proper manipulation, the lens/screen is angled to reject ambient light and to reflect an image to any desired audience window.

An Airborne Video/Motion-Picture Surveillance System (Wood) outlines a system developed by the U.S. Air Force which includes the use of helicopters with manned cameras looking down through the dust cloud (the subject of their study), with extremely long lenses to insure crew safety. A Tyler camera mount, a Cohu 2000 Vidicon CCTV camera, a high-speed 16mm Cinerama camera with built-in through the lens viewing were incorporated into a single-lens optical system using an Angenieux 25–250mm zoom lens and a Dynalens which was used to provide additional stabilization of the long focal-length lens. A viewfinder for the system was provided using a 4½-in (114 mm) monitor.

THURSDAY

Television I

Pioneer Image Converter System (Baker) outlines the operation of this system developed to transmit pictures back to earth from the Pioneer 10 spacecraft (when it flew by the planet Jupiter in early December 1973). The transmitted pictures were then converted to TV signals in real time, thus allowing the experimenters to control the spacecraft and the onboard Imaging Photo-Polarimeter so as to optimize pictorial data.

A New 24-Frame Television System for Tape-to-Film Transfers (Bluth, Ringer & Holland) describes the Image Transform Image 655 system. The system can be used for any videotape production that is intended for film release only. Once a tape is recorded in the 655-line format, it cannot be broadcast as a tape. Four major improvements are offered for Image 655 over 525-line standard television: First, the annoying motion discontinuity, created by the usual 30 television frame conversion to 24 film frames, is removed from both large-screen presentations and telecine playbacks because it is a precise frame-for-frame conversion. Second, there is an improvement of vertical resolution and a corresponding reduction of line structure effects because the lines are much closer together. Third, there is greater picture noise reduction because of the closer line

The opening of the Equipment Exhibit. Standing before the crowd waiting to get in are (l-r) Arrangements Chairman Robert Gustafson, Conference Vice President Harry Teitelbaum, Executive Vice President Kenneth M. Mason, Exhibit Chairman Warren Strang, and Hotel Chairman Ed Burns.

structure. Fourth, there is improved color resolution.

A New Data Receiver Using the SMPTE-Developed Time Code C98.12 (Gray, Reitz, Jr. & McFadin) provides performance details for this equipment which is available for use with any tape system having the necessary recorded time code. The equipment also includes a local display of the time code, a start/stop comparator, and a character generator. Provisions have been made for computer interface and auxiliary remote displays.

Applying the Microcomputer to Television Editing Systems (Swetland) illustrates some unique systems for controlling video and audio tape recorders utilizing the microcomputer in conjunction with the proposed industry standard Time Code (Proposed American National Standard C98.12). Special features of such systems include ease of programming and modification, time-sharing for maximum utility and self-checking for maintenance.

Quadruplex Video Noise and Measurement Techniques (Elliott) analyzes the various methods used to determine the level of video noise in the playback of videotapes, examines the sources of tape noise and proposes a new method of relative measurement which will more closely correlate with visual observations.

An Experiment in Vertical-Interval Frame-Locked Editing With an Inexpensive VTR (Wall & Kaemmerer) explains the design and use of an experimental circuit for the Ampex VR-7800 to permit vertical interval, frame-locked edits. In operation, the circuit causes one VTR to delay going into, or coming out of, the "record" mode until a frame-timing signal is sensed. Adjustable time delays are incorporated to compensate for pull-up and release times of the VTR record relay.

The Design of a Time-Base Error Corrector for All VTRs (Lemoine) summarizes the results obtained using an analog time-base corrector (TBC) and describes the results of a feasibility study to evaluate the digital TBC approach. The effects of sampling, quantizing noise, and quantizing errors are noted, both in subjective and measured terms, on direct replay and after successive generations. A description of operation follows, showing how coarse and fine correction take place and how system configuration allows operation in all VTR applications, in all standards, by simple changes on a few printed-circuit boards.

Design of a New Portable Color Camera Chain Using Chalnicon Pickup Tubes (Hansen) provides the primary objectives in the design of the Asaca ACC-5000 portable color television camera: small physical size, light weight, high sensitivity to light, accurate color reproduction and adjustment-free operation. Optical system and electronic design specifications are given.

Television II

Progress Report of the JCIC Ad Hoc Color Television Study Committee (Benson, DeMarsh & Davidoff) defines the objectives of the Committee. Two presentations describe in detail how the basic problem affects U.S. television and recommendations are made for its solution. The design considerations and the practical effects on color reproduction are reviewed. The progress by a task force of broadcasters in appraising the advantages of the corrective matrix for display phosphor differences from NTSC are reported and the practicability and means to implement its use in broadcasting operations discussed.

Principles of Quadruplex Videotape Recording — An Overview (Fibush) gives a brief, qualitative description of quadruplex recording, with emphasis on signal processing and format. Extensive references are offered to aid anyone interested in more quantitative detail.

Biased Tape Guidance for Improved Videotape Performance (Bick) describes how a biased tape guidance is shown to eliminate almost all cases of chroma flutter without producing geometry errors or difficulties with interchange.

Recent Developments in Quadruplex Video Recording (Sadashige) explains that it is now possible to operate quadruplex video recorders at half tape speed (7½-in/s; 190.5-mm/s) with the same video performance as users are now achieving at 15 in/s (381 mm/s), without resorting to the use of a high-energy tape. This paper describes the slower tape speed and several other aspects of a possible new quadruplex format which would take advantage of recent years' technological advances in video recording.

Methods and Approaches to Videotape Editing (Field) offers useful practical guidelines to those who wish to provide their production staff with editing facilities that are comprehensive, yet cost-effective. The procedure thus described is illustrated by indicating the results of typical evaluations, but it is emphasized that each location has its own requirements and the conclusions reached in these examples are specific to the locations analyzed.

Alternate Techniques for Time-Base

View of the Equipment Exhibit.

OMEGA PRODUCTIONS

March 11
1 9 7 4

Mr. Eric Falkenberg
Eclair Corporation of America
62 West 45th Street
New York, New York 10036

Dear Eric:

Here are the glossies I spoke to you about. I think the still shot of the operating room conveys a nice sense of surgery's inherent drama, while also demonstrating the ACL's unobtrusiveness.

As for the frame blowup...I think it speaks for itself. During the surgical procedure...a triple coronary artery bypass performed by Dr. Donald Kahn and his team of cardiosurgical specialists...the patient was critical at several points. Had our production team not been virtually invisible, I'm sure we'd have been asked to leave.

Omega cameramen were able to move about and shoot at will...even at times, from the anesthesiologist's position, which gave us a clear shot into the chest cavity where the patient's heart lay dramatically exposed.

We exposed nearly 3000 feet of film silently, quickly...invisibly. I think it's fair to say that the mobility and low sound level of the ACL made our assignment a total success. A lesser camera might have caused us to scrap the whole project.

Cordially,
OMEGA PRODUCTIONS INCORPORATED

Erv Penkalski
Ervin Penkalski
President

EP:mk

OMEGA PRODUCTIONS, INC. 711 WEST CAPITOL DRIVE MILWAUKEE, WISCONSIN 53212 PHONE: (414) 374-7900

Substantially more than the success of a production hung on the silence of Omega Productions' ACL as they filmed a triple coronary artery bypass. How well Eclair repaid that trust is shown in Irv Penkalski's letter.

Just what ACL's unique combination of qualities means in terms of your particular shooting style, assignments and special requirements, only you can determine. Our straightforward, "no-nonsense" brochure will help. Call or write: Eclair Corporation, 62 West 45th Street, New York 10036 (212) 869-0490. 7262 Melrose Avenue, Los Angeles, Calif. 90046 (213) 933-7182. Better still, visit your Eclair dealer and ask to see the ACL.

at the threshold of life **eclair**

Correction of Videotape and Disc Recorder Signals (Paulson) discusses the capabilities and weaknesses of various time-base correction techniques in relation to users' requirements for output-signal specifications.

Video Processing for Film (Biehl) describes the video experiments performed at UCLA's Experimental Television Laboratory. It was demonstrated that the television camera itself can be a unique image-processing instrument. When the camera is focused on a video monitor which is in turn connected to the output of the camera via a video switcher, a feedback loop is formed. The effect of the camera "seeing" itself can produce sensational artistic results. This becomes particularly apparent when the camera's output is combined with another video signal via a special-effects generator to give the video-processing technician some control over the source of the changes in the image. Factors affecting the visual appearance of the reverberating image are discussed.

FRIDAY

Videodisc Consumer Player Systems

Videodisc Systems (Kreiman) traces the evolution of visual-communications technology from lantern slides through videotape. The next step in this evolution is videodisc technology, it is suggested. the various systems are described and their advantages are outlined.

A Review of the MCA Disco-Vision System (Broadbent) provides the operating characteristics of this system. The 12-in-diam (305-mm) Disco-Vision disc is made of plastic sheet, is typically 0.006-in (0.15-mm) thick, and provides full-color high-resolution pictures for up to 40 min playing time per side. The program material appears on the disc in the form of a spiral running from the outer diameter of the disc inward with a pitch of 80 μin/rev. (0.000203 mm/rev). Density is 12,500 tracks/radial in (492 radial tracks/radial mm). The disc revolves at a rate of 30 rev/s and the playback unit employs an optical system with a non-physical contact, low-powered helium-neon laser beam readout. This beam is electronically servoed to follow the recorded-information spiral without making contact with the information track itself. Mastering from tape, film or live sources is accomplished in a real-time process using a laser writing beam and electrooptical modulation techniques. The disc is subsequently processed to produce a stamper from which replica discs are produced.

Film-Based Videodisc System (Jerome & Kaczorowski) describes a videodisc system which uses silver halide films or their equivalent as the basic storage medium for video signals, developed by I/O Metrics/Videonics Corp. The video signal is recorded in an analog fashion, with both width and density variations forming the encoded video signal. A spiral track is written using a modulated laser beam, with intensity (exposure) matched to the film characteristics to achieve a linear signal on playback. Noise introduced by the film is said to be negligible. The laser modulation process has a bandwidth to 7 MHz (−3dB point), without pre-emphasis, which determines the bandwidth for the recording process as a whole. Any FM encoding process may also be used to record the video signal, provided that the process is consistent with the 7-MHz bandpass; but the direct analog approach has been found to be the simplest and most satisfactory in actual practice. Recording the analog signal directly has the advantage that the recording and playback electronics are greatly simplified. Color information — for example, with the NTSC system, the 3.58-MHz subcarrier — can be recorded directly on the disc.

The Video Long-Play Disc System "VLP" (Compaan & Kramer) describes a system where the video and audio signals are contained in the disc surface in the form of a spiral track of shallow pits. The number of pits read out per second is a measure of the picture-brightness (FM modulation) and the length of the pits a measure of the color and sound information (pulse-width modulation). For the recording process, use is made of a high-power laser producing (in real time) a master record from which the pressing molds are made. The player reproduces the electronic video signals from the pressed copies by means of a reflected beam from a low-power He-Ne laser. An advantage of this optical read-out method is that it allows a separation of the information-carrying layer from the geometrical surface of the (transparent) disc so that dust and scratches on this surface are out of focus and therefore cannot interfere with picture (and sound) quality. Also there is no wear, either of disc or read-out objective.

Printing Under Pressure (Zwaneveld) presents a summary of observations resulting from a recent study by one institutional producer and user of motion and still visual materials. An analysis of cost effectiveness in production and packaging of motion pictures, videotapes and filmstrips is made. From a producer's and user's viewpoint, the relative advantages and disadvantages of the various visual information carriers, including the new videodiscs, are considered.

The following papers were added at the last moment to the Videodisc Consumer Player Systems session: *An Experimental Optical Video Playback System* (Hrbek) and *A Summary of Videodisc State-of-the-Art* (Pfannkuch)

Safety and the Motion-Picture and Television Industry

Effective Self-Compliance: A Major Goal of OSHA (Gillotti) outlines the intent and operating procedures of the Occupational Safety and Health Administration. What they are doing, the author says, is enforcing with reasonableness, a piece of regulatory legislation. The cooperation of all interested individuals is sought to help achieve a safer and healthier workplace.

The Motion-Picture and Television Film Industry and the Division of Industrial Safety (Schlemmer) summarizes the results of a program for reviewing and updating of all industry safety standards.

OSHA and the Motion-Picture Film Industry (Degenkolb) reports on the activities of the Labor-Management Committee of the Motion Picture Producers Association. Numerous Safety Bulletins and Special Safety Bulletins have been developed for the guidance of the various crafts, guilds, unions, employees and employers.

OSHA Inspection (Regan) outlines the experience of having a member of the Department of Public Safety conduct a three week safety inspection at the Burbank Studios.

Cancelled Papers

The following papers were cancelled, though listed in the Conference program: *The Electronic Optical Printer* (Nolan & Van Der Veer); *Automatic Fade and Dissolve Shutter With Provision for Adjusting to Specific Film Gammas* (Banks); and *The TED Videodisc Player* (Schiering)

Equipment Exhibit

The 115th Conference Equipment Exhibit can best be described in superlatives. Though we hesitate to say something like the "best ever" since sometime in SMPTE's glittering past there may have been an equipment show that someone thought was better, this exhibit was pretty good. First of all, the exhibit was more than completely sold out. As was said earlier, Exhibit Chairman Warren Strang managed to sell an additional 4 booths over the maximum space by clever manipulation and expansion of some booths from 10 to 15 ft, where possible.

The Exhibit was heavily weighted in favor of motion pictures, with participation of most of the major manufacturers of cameras, editing equipment, printers, lighting equipment, sound equipment and other such merchandise. Yet there seemed to be a slight trend building toward participation by TV companies, since several TV equipment manufacturers had booths (e.g., International Video Corp. and RCA). Others had expressed late interest but could not be accepted because of the sellout.

The success of this exhibit can be laid to the efforts of Warren Strang who began months in advance planning, organizing, working with the hotel and service companies, and with, of course, the exhibitors. Strang has been praised for his work as Exhibit Chairman and the Society is grateful that he was able to do it again for the seventh time in as many Los Angeles Conferences.

The Exhibit opened, as usual, on Monday afternoon at 5:00 p.m. with the Exhi-

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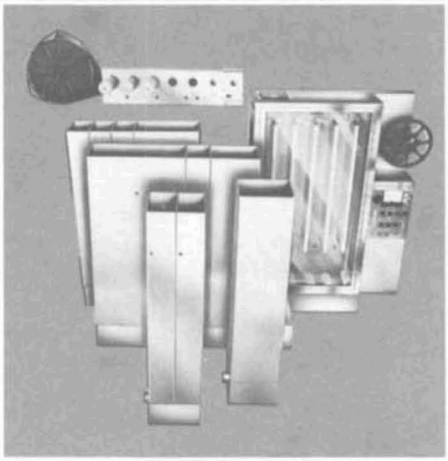

Obviously, the use of common components also means you won't have a problem getting parts in years to come, whether you order a standard or custom design.

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bitors Open House. This opening cocktail party is one of Strang's innovations that have proved popular with exhibitors and attendees since it was first started several years ago.

The Directory of Exhibitors, containing equipment descriptions of many of the exhibitors, appeared in the March SMPTE *Journal* pp. 232–242.

The following companies were exhibitors at the 115th Conference.

Angenieux Corp. of America
Arriflex Co. of America
Belden Communications, Inc.
Bell & Howell Co.
Berkey Colortran Inc.
Birns & Sawyer, Inc.
CAN-AM Photo Equipment & Camera Service Ltd.
Canon, U.S.A., Inc.
Carter Equipment Co., Inc.
Christy's Editorial Film Supply
Cinema Products
Cinemobile
Communication Arts, Inc.
Dolby Laboratories, Inc.
Eastman Kodak Co.
Eclair Corp. of America
F&B/Ceco Industries, Inc.
Frezzolini Electronics Inc.
Frigidheat Industries
General Electric
Lamp Business Div.
General Enterprises, Inc.
Alan Gordon Enterprises, Inc.
GTE Sylvania Inc.
Guillotine Splicer Corp.
Hazeltine Corp.
Karl Heitz, Inc.
Hervic Corp./Cinema Beaulieu
Hollywood Film Co.
Image Devices Inc.
Instrumentation Marketing Corp.
International Video Corp.
Javelin Div., Apollo Lasers Inc.
KEM Elektronik Mechanik GmbH
L-W Photo, Inc.
Lowel-Light Photo Engineering
Magnasync/Moviola Corp.
Mead Technology Laboratories
Metro/Kalvar Inc.
Mitchell Camera Corp.
Mobius Cine Ltd.
Mole-Richardson Co.
Nagra Magnetic Recorders, Inc.
O'Connor Engineering Labs Inc.
Oxberry
Paillard Inc.
Peterson Enterprises, Inc.
Photo Media
Photo Research
Plastic Reel Corp. of America
PSC Technology Inc.
RCA Photophone
Recotec
Redlake Corp.
Research Products, Inc.
Rhoadshow (Rhoads Industries, Inc.)
Rosco Laboratories, Inc.
Showchron
Technology, Inc., HF Photo Systems Div.
Treise Engineering, Inc.
Vega Electronics
Wilcam Photo Research, Inc.
Hans Chr. Wohlrab

Social Activities

There were several occasions when Conference attendees were able to socialize. Of course, there was the Get-Together Luncheon on Monday noon, and the Monday evening Exhibitors' Open House.

In addition, there was the official SMPTE Wine and Cheese Party Sunday evening held at the brand new Kirkeby Center. This Wine and Cheese Party was sponsored by the Eastman Kodak Co.

On Wednesday evening, was held the traditional Cocktail Party, Banquet and Dance. The Cocktail Party was courtesy of Treise Engineering, Inc. and Frank Holmes Laboratories, Inc. The Banquet Chairman was Jack Leahy, RCA.

Committee Meetings

One of the purposes of the National Conference is to provide a location at which many SMPTE Committees can meet, particularly since many people are on more than one committee, and of course come from diverse locations.

The most important SMPTE Committee, of course, is the Board of Governors which met on Sunday. Ten engineering committees met during the week, numerous administrative committees met, and there was also a joint meeting of the Publi-

cations Advisory Committee and the Board of Editors.

Ladies Program

A splendid week of exciting activities made the 115th Conference a memorable one for participants of the Conference Ladies Program. Ladies Committee Co-Chairladies Doris Scobey and Eve Kloepfel kept the women busy all week with a program of interest and adventure. The congeniality and hospitality of the members of Ladies Committee surely added to the week's enjoyment.

The ladies' activities were highlighted by an astrology lecture by Alice Reichard and a visit to the Harold Lloyd estate on Monday; a cruise of Los Angeles harbor, lunch at Fort MacArthur, and shopping at Ports O'Call on Tuesday; a visit to the J. Paul Getty Museum on Wednesday; a charter boat tour of Lake Arrowhead and a visit to Brookside Winery, or a day at Hollywood Park Race Track on Thursday; and a visit to California Mart and lunch at the Horikawa Restaurant in Little Tokyo on Friday.

The members of the Ladies Committee were: Davida Brackett, Iona Bruno, Julie Burns, Elsie Eggers, Bea Farmer, Beth Frith, Allegra Goetz, Rosemary Gustafson, Ann Gyori, Hazel Hanson, Rosemary Hinkle, Helen Holm, Bea Hopkinson, Carlotta Jacobs, Shirley Kreiman, Berdine Lakotas, Carol Leahy, Shirley Mansfield, Dotti Murphy, Alice Reichard, Joan Robertson, Hortense Singer, Cecelia Strang, Ida Teitelbaum, Vonna Westphall, Billie Whiting, Murph Williams and Mary Jean Wright.

Short Films

A short film opened every session of the Conference. The following is a list of the films shown during Conference week. These films were arranged for by Short Films Chairman Phil Singer, Agfa-Gevaert. Modern Talking Picture Service, Inc. most graciously made all the films available at no charge.

ISO-1973, Sponsor: American National Standards Institute

Joey's World, Sponsor: Southern California Edison

Operation Scarp, Sponsor: Borg Warner

Sea Probe, Sponsor: Alcoa

What Was, What Is, What Will Be, Sponsor: Verde Valley Chamber of Commerce

Pets, Handle With Care, Sponsor: Ralston Purina

Land of Legend, Sponsor: Rhodes Tourist Board

The One Man Band That Went to Wall Street, Sponsor: New York Stock Exchange

Honolulu, Sponsor: United Airlines

Experiments in Motion Graphics and Permutations, Sponsor: IBM Corporation

Energy and All That, Sponsor: Western Oil & Gas Association

Acknowledgments

The SMPTE thanks the following companies and organizations for helping make the Conference a success by their support of these essential activities.

Coffee Club: Philip A. Hunt Chemical Corp.

Wine and Cheese Party: Eastman Kodak Co.

Cocktail Party: Treise Engineering, Inc. and Frank Holmes Laboratories, Inc.

Message Center: Pacific Telephone and Telegraph Co.

Ladies Gifts: Agfa-Gevaert Inc., Alice Reichard, American Film Industries, A.M.P.T.P. Research Center, Consolidated Film Industries, Davida Brackett, DeLuxe General Dymat International Corp., Eastman Kodak Co., Fuji Photo Film U.S.A., Glen Glenn Sound, Goldberg Brothers, Hollywood Film Company, Hollywood Film Enterprises Inc., Metro-Goldwyn-Mayer (MGM) Laboratory, Movielab-Hollywood Inc., Producers Service Co., Technicolor, Inc., 3M Company

Short Film Subjects: Modern Talking Picture Service, Inc.

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It is this Liquid Gate System, installed in any Optical Printer, that makes it possible to eliminate the effect of all base scratches and most of the other effects of scratches and surface defects on the film reproduced. The Oxberry Liquid Gate can be operated at all printer speeds in forward, reverse and stop-motion freeze frame with no turbulance streaking. Bubbles and splices are passed without disturbance. This Liquid Gate provides the only proven way, to handle the softer C.R.I. materials.

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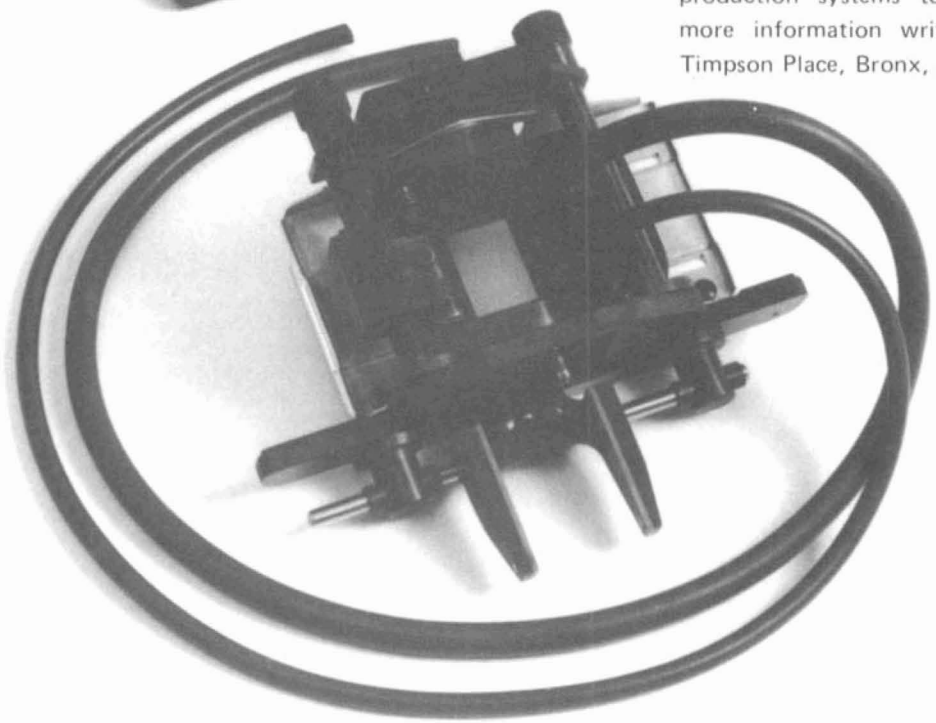

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