ADVANCED SOUND FOR SUPER 8

by Tony Galluzzo

Ektasound has already made its impression for the home movie buff who wishes to record and shoot the simple sound-on-film pre-striped way. For more demanding, advanced aspirations, there are more advanced ways you can go. One is the Super 8 Sound recorder by Super 8 Sound. Another is the Cine-Slave by Inner Space Systems. Then there is the Richard Leacock-MIT crystal sync system which we fully covered some time back ("Moviemaking," Dec., 1972, pg. 52). Since the latter has spiraled upward of $7,500, we'll leave it to the moneyed pros and return to the two professionally-oriented systems left—Super 8 Sound (beginning at right) and Cine-Slave (beginning on page 116). The basic unifying factors about both are that, in most cases, you don't have to convert your camera if it contains a flash sync contact; you can record sound on a separate tape which allows double system editing; you can transfer sync sound from tape to stripe-on-film with a modified projector. eliminating the lab in the middle; you can use a variety of recorders modified by each company. Also both allow you to get involved in creative and complex editing for professional results.

One-man show: While we don't recommend you concentrate on picture and sound concurrently, it's possible. With sound barney to quiet camera, you can hold microphone fairly close without noisy motor whine creeping 'into recording and ruining your sound.

Super 8 Sound Approach to Sync

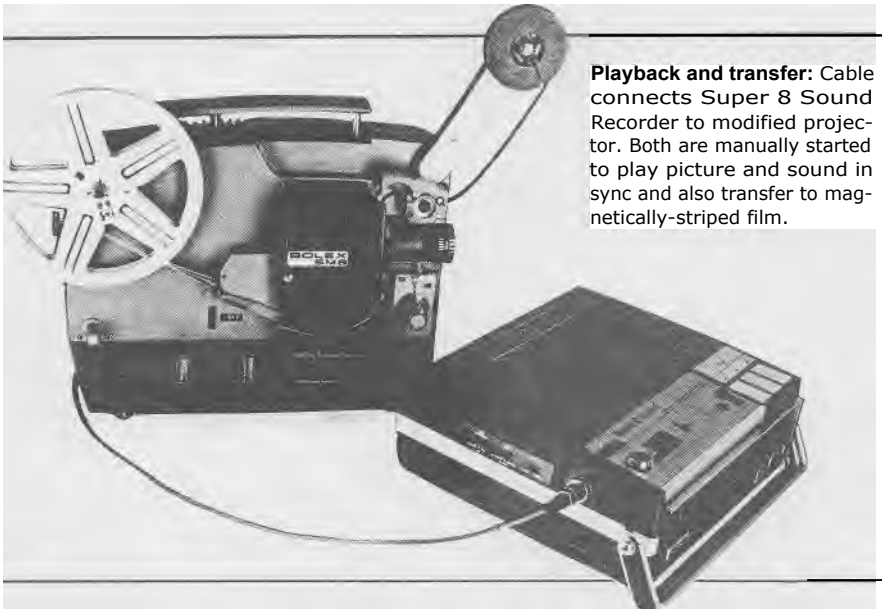
The Super 8 Sound Recorder was built to conform to professional aspects of super 8 and 16mm. According to its prime mover and creator, Robert 0. Doyle, an astrophysicist from Harvard, the recorder is "based on *the* professional sound magnetic film. All of the professional techniques used in 16mm and 35mm through the years are available to a super 8 filmmaker if he works with super 8 fullcoat, and the super 8 equipment looks and feels the same as 16mm."

Now please don't go running madly away from that rather imposing statement. While no one has ever claimed that putting a sound movie together was as simple as clipping coupons, there are ways and there are ways. Some, indeed, are more direct and comprehensible than others.

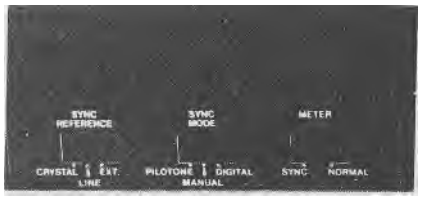
But let's start with the material in

Unmodified sync: Super 8 cameras with flash sync contacts need no internal modifications for either Super 8 Sound or Cine-Slave approach to synchronized sound.

Hush cover: Leather and foam camera barney from Super 8 Sound snaps neatly into place to subdue camera noise.



Playback and transfer: Cable connects Super 8 Sound Recorder to modified projector. Both are manually started to play picture and sound in sync and also transfer to magnetically-striped film.



Super 8's many modes: With a flip of the switch, you can choose either *digital* (cameras with flash sync), *Pilotone* (cameras with sync generator 60 Hz pulse) or *crystal* sync using crystal clock in recorder and special modified cameras.

question. What *is* super 8 super 8 magnetic as it is sometimes referred to? It's simply a strip of polyester or acetate-base tape coated with magnetic oxide just like recording tape. Its width, however, and the size and spacing of its sprocket holes, are identical to a piece of super 8 picture film. When you're ready to edit, you take both strips and place them in a sound-synchronizing block (pictured) which advances them in unison through the use of "gangs" or sprocket wheels. What's this do? Well, since the sound on tape (as originally recorded in sync with your camera) is in frame-to-frame relationship with your film, each sprocket advanced on the tape is another frame advanced on the film. When you wish to match sync sound dialogue to your subject's face on film, for instance, you simply line them up and cut straight across, sprocket for sprocket. The super 8 film goes through a viewer and then through the synchronizer. Another reel on your rewind holds the fullcoat and this, too, is laced through the synchronizer and onto your take-up reel. The only difference here is that a magnetic sound head sits above this synchronizer wheel to "read" sound off the tape as you look at the picture in the viewer. The sound head is positioned some 18 frames ahead of the corresponding picture gate in the viewer—just as it would be on a super 8 sound projector. In order to hear your sound, of course, you will need some sort of amplifier and speaker system hooked into the magnetic head. With the Super 8 Sound Recorder, however, the problem is easily solved since it can now convert to a monitor for your editing bench.

Take any super 8 camera you may have and check to see if it contains a flash sync outlet. (This means it will have a once-per-frame contact.) If so, you merely connect the proper sync cable to the recorder (a modified Sony TC 800B) as we did in testing. You set the sync mode switch on the recorder's side to "digital," then flip the sync reference switch to "external." Run the camera for a few seconds and observe the VU meter on the recorder—now acting as a phase meter—to get the recorder in sync with your camera. As you turn the speed control dial on the front panel, you steady the needle so that it ceases to flip-flop across its range. When you've achieved this, you've achieved synchronization. The re-

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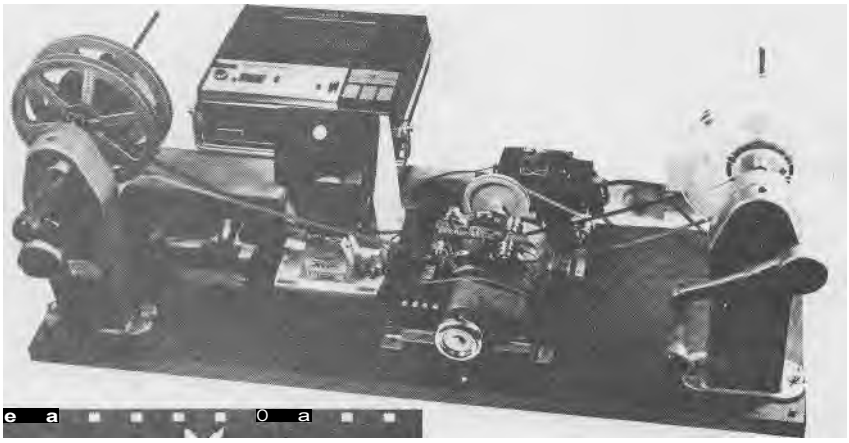
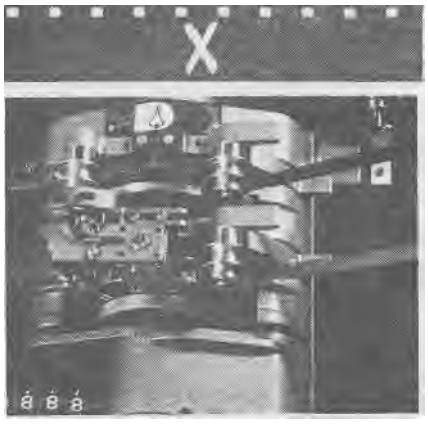




One-to-one editing: With above setup you edit in conventional manner, as with 16mm. Film goes through viewer, then synchronizer block. Super 8 fullcoat tape is also sprocketed to go through synchronizer. Magnetic head (left) is dropped over fullcoat to pick up sound which is played back through Super 8 Sound Recorder in sync with picture seen in viewer. When you mark cut point on film frame, also mark directly across on fullcoat for cutting in sync.

corder's servo-control circuitry matches the speed of fullcoat in the recorder to that of the film running through your camera by means of a phase-locked loop. (Output signal from camera and reference signal from recorder are compared and locked together to achieve sync.)

Here's what happens inside the recorder. Sprockets on the fullcoat are counted as they pass a photo sensor. The camera. meanwhile, is sending a series of digital pulses into the recorder. This series—also known as a pulse train—is then compared to the sprocket count being ticked off by the photo sensor. Sitting in there is a servo-controlled circuit which calculates the difference and locks the recorder's advance movement to that of the camera. Since super 8 cameras—even the more expensive ones—are not always running at a precise 18 or 24 fps. the recorder will compensate by following the camera's speed once the needle is steadied on the meter. Should the needle move completely to one side and back again while shooting. this would represent the loss of one frame of sync.

At one point. I noticed that the needle did not move at all (usually it flickers slightly at the same position). Remembering the hazards of cable connections. I immediately checked and found that the tuchel-plug connection at the recorder's sync input was loose. The locking coller on the plug was then turned and secured and sync was reestablished without much effort. (In stabilizing the recorder. by the way. it's best to check the sync needle with film in the camera. due to changes in stress when film is being pulled through.)

Because the sync meter is the same as the VU meter. you either place the function switch to "Sync"—or "Normal" to monitor the audio level. You can't practically monitor both at the same time. After monitoring sync on one full cartridge and observing its reliability. I decided to cast fate to the gods and monitor my audio signal instead, so as not to overload the recording.

Tune-in sync: Recorder's speed control is conveniently near other dials, so you can. easily stabilize synchronization.

The other way out of this dilemma is to switch to automatic gain control. This is quite a handy feature if you're shooting in a crowd and operating the recorder as well as the camera. You may not end up with the best-of-all-possible sound, but you will get acceptable recordings. In a.more controlled situation, it is always best to use the manual volume control, especially when a second person is available to intelligently operate the recorder. (There is also Sony's built-in Electret microphone. but the sound is rather dreadful for film use and I don't recommend it, except in an emergency.)

We shot film using the microphone that comes with the recorder, an adequate cardioid that provides decent sound. Then we switched to Sony's ECM-19B mike that sells for $29.95. The increased sensitivity of this mike was immediately apparent and we continued using it throughout our shooting to strive for the best possible quality. To improve things further, we placed Doyle's newly-designed sound barney (or blimp) on the camera to subdue the motor's whine to a bare minimum. The barney, lined with foam and covered with finely-crafted leather, has to be custom-made for your particular camera. Because of that the price is now $135. although Doyle started out optimistically with a price of $60. (Also available are barneys for Kodak sound cameras.) The barney we used was custom-made for the Nizo S480, with openings for the meter window and footage counter plus a plastic knob on the side that links directly to the manual f/stop control on the camera's side. You can, therefore, change exposures without unsnapping the cover each time, and this was very convenient in our shooting sessions.

Upon playback, we discovered that, al-

though you do hear a hushed camera motor while standing close to the machine, absolutely no camera noise crept into the recording. Using the ECM-19B microphone with the converted Sony. we were able to obtain voice recordings that approached brilliance in tonal quality.

The fullcoat used was Pyral made in France. This material has a polyester base and measures only 3.3 mil in thickness. The only other fullcoat that we know of is made by 3M, having a thickness of 3.8 mil. The reason I stress the thickness of fullcoat is because of a contention in the recording industry that better response is assured if tape is thinner and more flexible so that it properly "hugs" the recording head. Regular 1/4-in. tape, for instance, is usually about 1.5 mil. But this thickness business may well be an argument of diminishing returns. For one thing. it's difficult to really tell the difference between tape 3.8 or 3.3 mil thick: we've used both. For another, if fullcoat were any thinner, you would have a miserably difficult time handling the stuff while editing, since it would stick to your fingers and flop all over the place—one reason why cutting 1/4-in. tape is a big pain.

Another difference between fullcoat and 1/4-in. tape quickly becomes apparent. You must use only super 8 plastic reels—such as the self-threading reels made by Eumig or Bonum and supplied with the recorder. Normal 1/4-in. tape reels are slightly narrower between flanges and the super 8 fullcoat tends to catch and then bunch up unevenly oh one side. This causes pulling which in turn causes "wow" as tape passes the magnetic head, but the defect will show on the sync meter. At any rate, to save yourself the grief, stick to super 8 plastic reels.

The only two things that may really make you think twice before recording directly on fullcoat is the price of this material and the fact that you are cutting your original when you edit. The price of 380 ft. (19 min.) of Pyral fullcoat is $12: 1200 ft. (1 hour) is $36. This is slightly more than the price of 16mm magnetic film, but you get more sound per linear foot on super 8 fullcoat. (Super 8 has 72 frames per ft. while 16mm has 40; running speeds for both are 24 fps, so you can figure it from there.)

Transfer cassette to fullcoat

If you would rather use cassette tape for original sync recordings. Super 8 Sound now offers either a converted Norelco 150 carry-corder or Philips N2209 AV for $119. Both accept the digital pulse generated from a super 8 camera having the flash socket. The Norelco, now called the Scipio in its converted form, can be instantly started and stopped with cameras having a tape recorder start/stop jack. Super 8 also has more expensive units including the Sony TC55 that can be slipped into the subject's pocket without connecting a cable to the camera. Sync is achieved here with a crystal oscillator that tunes in on converted cameras with crystal control such as the Leacock / MIT-converted Nizo S56.

After you finish inital recording on the cassette unit, attach a special cord between it and the Super 8 Sound recorder and you can transfer in sync onto super 8 fullcoat in order to edit, and protect the original.

In finally transferring our own sound tracks to stripe-on-film, we had our friendly projector whiz (Vilmos Keresztes at Marty Forscher's Professional Camera Repair service) take the varied ingredients that come with Super 8 Sound's modification kit and convert a Bolex SM8. Since the Bolex was now equipped with a once-per-frame contact switch, it was possible to transfer in absolute sync from fullcoat to our striped film.

From Ektasound to fullcoat

If you already have sound-on-stripe from Kodak Ektasound films. for instance, it's possible to also transfer from stripe to fullcoat using the Super 8 recorder. Now you can edit fullcoat on an editing bench and retransfer back to stripe.

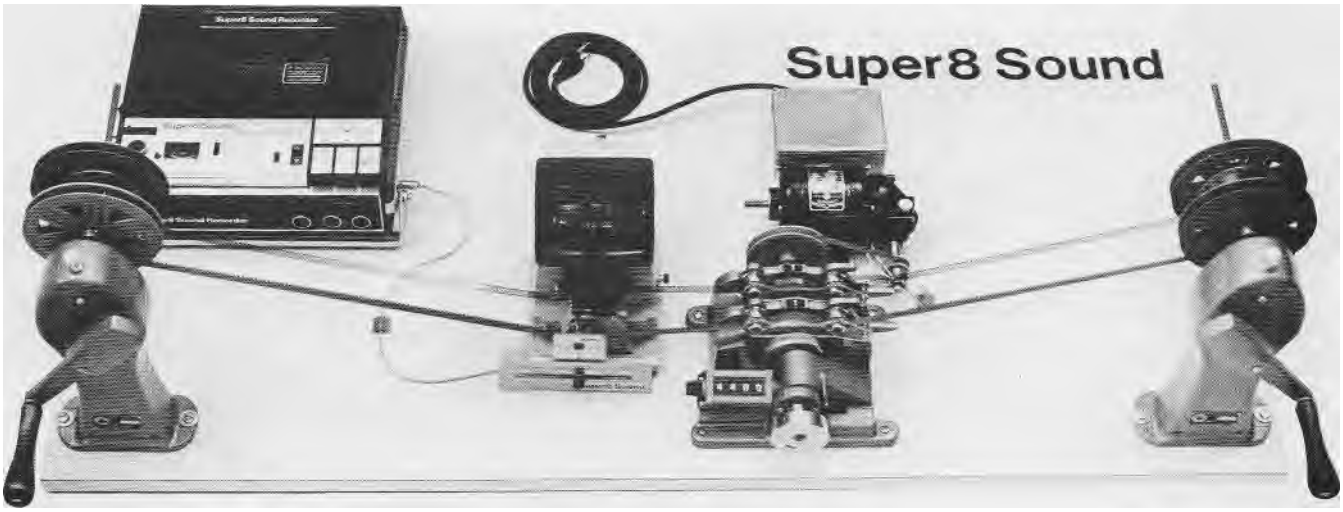
If you would rather not stripe your film, or if you wish to look at what you've shot several times before editing. simply connect a sync cord from the recorder's sync socket to the modified projector. Line up your clap stick or hand-clap sound on fullcoat over the recording head and the matching film frame in the projector's gate. (Some sound projectors do not have motors powerful enough for common start with the recorder. In this case, run the starting frame about one-half foot after the gate. then hit the recorder's button. You will eventually find the point at which the projector comes up to speed in sync with the recorder.) With the Bolex SM8. which does have a heavy-duty motor. I was able to review the films shot in correct sync nearly every time I tried it by punching the recorder playback button and turning the projector on simultaneously. The circuitry in the recorder faithfully follows the projector's speed and you can verify this. again, by looking at the sync meter's steady needle. (Price for the conversion kit is $30; price for the conversion at Professional Camera Repair. 37 W. 47th St.. New York. N.Y.. is $35.)

The Super 8 Sound Recorder itself. which acts as the focal point for nil of these functions, is priced at $595. (By changing the guide posts in the machine, you can also use it for 1/4-in. tape recording, but not for sync shooting on '/4 in.) A basic double-system editing bench offered by Super 8 Sound consists of the excellent Minette S-5 viewer, two Hollywood/ Moviola rewinds, and a two-gang synchronizer (two sprocket wheels) with mag head and frame/footage counter ($350). If you already have a viewer and good rewinds that accept at least two reels at a time, all you really need is the super 8 synchronizer made by Hollywood Film Co. The mag head should be wired with a jack that fits into the Super 8 Sound Recorder in order to use the machine as a monitor as you crank through sound and picture film simultaneously. (A two-gang synchronizer and mag-head block retails for about $200 at professional supply houses such as SOS Photo-Cine Optics, Inc., 315 W. 43rd St., New York. N.Y.)

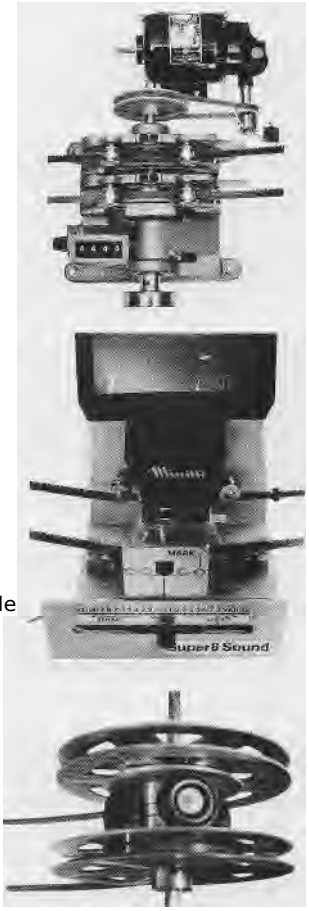
You can go from there and acquire a motorized editing bench or even a sophisticated. horizontal editing table, but then you might as well have the finances to start your own production house. To find out all the ins, outs and other components available from Super 8 Sound, write them directly at 77 Huron Ave., Cambridge, Mass. 02138.—THE END

The Super8 Sound Editing Benches

The Super8 Sound professional motorized Editing Bench is an economical system for editing Super 8 picture and sound on Super 8 fully coated magnetic film in sync. Its design incorporates features which diminish or eliminate many of the problems usually encountered in editing with a synchronizer and rewinds.



The 2-Gang Bench



24 FPS Synchronous Motor Drive

The rugged two-gang synchronizer is driven at sound speed in the forward direction by a heavy duty synchronous motor. This drive system reproduces both voice and music intelligibly, and gives an accurate sense of timing of the film. The motor is operated by a convenient foot switch which also engages an electric clutch. The electric clutch instantly engages or disengages the motor from the synchronizer, which allows for accurate dialogue cutting and a quick transition from motor-driven sound speed to hand-driven rapid traverse.

Sliding Magnetic Head Assembly

An unusual sliding magnetic head assembly permits sync "tuning" 12 frames either direction from a reference point in line with the viewer while running at sound speed. This simplifies finding sync in difficult passages such as scenes with no clapmark.

Differential Rewind Adapters

Differential Rewind Adapters allow Super 8 reels to fit on 16mm rewind shafts and eliminate the familiar problem of "reel banging" in order to take up slack caused by reels of different diameters on the same shaft. Because the adapters provide true differential action between the reels of sound and picture, they allow the editor to move either strand independently without having to spend time adjusting clamps and spacers.

Roller "Outriggers"

A pair of roller "outriggers" have been added to the sync block. These "outriggers" pull the film free from the sprocket teeth when the synchronizer's regular roller arms are released and hold the film in the synchronizer rollers for fast forward and rewind of both strands, or one strand while while the other is held still. They also help reduce the time spent removing and repositioning either strand whenever it must be taken out of the synchronizer.

Viewer

The bench incorporates a modified Minette S-5 viewer, which has the brightest, sharpest image of any Super 8 viewer on the market today.

The Editing Bench comes complete with a pair of 16mm rewinds, a predrilled, 4' x 2' formica board and all the necessary mounting hardware.

Components of the Super8 Sound Editing Bench are available on special order to Super8 Sound.

Super8 Sound 2-gang Editing Bench (S8SEB2) $850

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Super8 Sound, Inc.
95 Harvey Street, Cambridge, Mass. 02140