



RANGER TONE, INC.  
MAGNETIC TAPE RECORDERS

NEWARK, N.J.

#### COVER ILLUSTRATION

Photographed during filming of "The Tanglewood Story", a State Department release produced by MPO Productions, N. Y. C. Sound Engineers operating Rangertone Synchronour Tape Recorder were Mr. Edward Fenton, Mr. Richard Gramaglia and Mr. William Schwartz.

## RANGERTONE, SYNCHRO MODEL

Sound engineers throughout the country, users of Rangertone Tape Recorders, have by their suggestions contributed to this latest model; the culmination of three years intensive development in magnetic tape recording. Smooth, simple controls that enable operation to be quickly carried out, epitomize the SYNCHRO model.

### RECORDING

The application of quarter inch magnetic tape to sound for motion pictures is the latest achievement which has stimulated the production of most accurately controlled tape movement. What is good for motion pictures in this regard, is equally excellent for broadcast and phonograph intermediate recordings. The greatly improved constancy of tape movement makes real piano recording now possible.

The exclusive features which have always characterized Rangertone Equipment are maintained in this SYNCHRO Model and the editing facilities have been further extended.

EDITING - As editing is one of the toughest jobs in handling tape, perhaps it exemplifies more effectively than anything else, the SYNCHRO facilities.

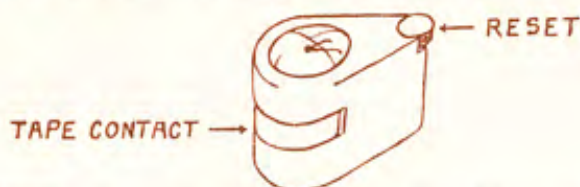


REWIND - As has been normal in all Rangertone Recorders, variable speed, forward and reverse rewind is much liked by these same users. It means that the operator can move the tape forward very rapidly to the desired spot on the tape and then he can slow it down and move it back and forth as necessary. This in conjunction with the new synchronous reversible tape movement gives complete ability for spotting.

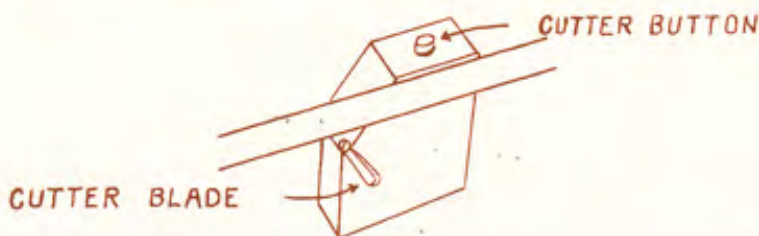




**FORWARD AND REVERSE PLAYING** - For the first time in any equipment, forward and reverse playing at correct speed are available in this new model. This means that not only may the tape be moved forward at its absolutely correct speed, but it may be instantly reversed at this same speed. It may seem strange that this has any definite value, but it does. Timing and tonality are quickly appreciated by the operator. This enables him to spot the exact points most readily. A three position lever switch accomplishes this. In its center position, the tape is held stationary against the capstan of the synchronous motor. When the switch is moved to the right, the tape moves forward instantly to the right at its normal speed. If the switch is moved to the left, the tape moves backward at standard speed.

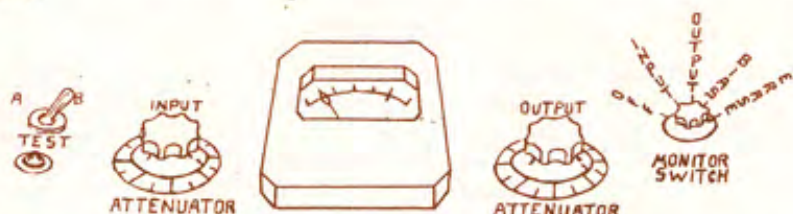


**COUNTER** - As a natural accompaniment to this precise tape movement is its measurement by the counter which registers in minutes and seconds. This counter may be fitted with a special dial to indicate corresponding film footage, either for 16 or 35 MM film. This counter adds when the tape moves forward and subtracts when the tape moves backward.

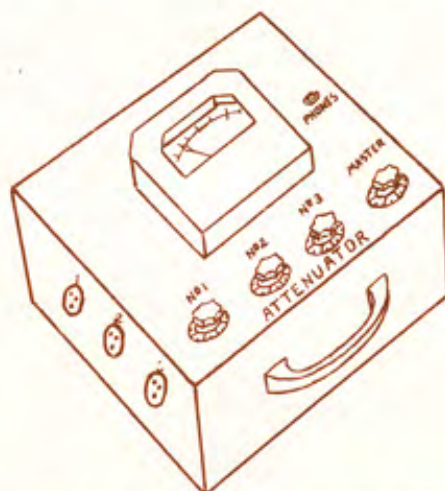


**CUTTER** - Another innovation in this model is the fixed cutter on the top plate which enables the operator to cut the tape most exactly. The tape is held rigidly while this operation is accomplished.

**BRAKING** - As formerly, dynamic or electric braking is used in this model. This means that direct current is applied to the motor for braking, rather than any mechanical clutch. This insures smooth action at all times, regardless of reel size, tape speed, or the length of use.



**MONITOR** - Full instantaneous monitoring facilities are available for either (A) monitoring the input signals to be registered on the tape, or (B) the resulting recording on the tape as it is being recorded. Facilities are provided for either loudspeaker, head phone, or meter indication of these signals. Built-in attenuators permit adjusting incoming and outgoing signals over wide ranges. A large scale broadcast type VU meter provides instantaneous indication of recording or playback levels, as well as the bias and erase voltages.



**MIXING FACILITIES** - A separate, ruggedly constructed three channel microphone mixer pre amplifier is available as option equipment. This unit is d-c operated to insure minimum hum and receives all its power from the standard record amplifier. Twenty-five feet of cable permits mixing operations at the most advantageous positions.



**SPEED REGULATION** - Provisions are made for running the tape at any two desired speeds. (A three speed motor will be supplied at a slight extra charge). Normally the two speeds recommended are 7-1/2 and 15 inches a second. Most professional work will be done at 15 inches a second. Equipment is furnished for either 50 or 60 cycle operation.



**TAPE SPEED REGULATION** - The linear tape speed of this equipment is extremely constant and may be regulated over small ranges. If the recorded tape is ten or twenty seconds too long or too short, the operator can alter the tape speed in order to change the playback timing. Such a small change will have no perceptible effect on the pitch. A flywheel between record and playback heads is the great advance in constant tape motion available first in this model. Flutter is of the order of .05 percent peak.

**LONG PLAYING TIME** - Extra long playing time is an outstanding feature of this equipment. Utilizing the full 1/4" width of the magnetic tape, almost one and one-half hours of recording time is provided at a tape speed of 15"/second. Better than five hours of uninterrupted recording is possible at a tape speed of 3-3/4 per second.



**BIAS CONTROL** - A readily accessible bias control allows the operator to select the bias value most suitable to the particular tape in use. It may be set for high or low coercive force values, thereby assuring optimum results. This feature will prove important as new tapes are introduced.



## MOTION PICTURE APPLICATIONS

That normal quarter inch magnetic tape without the benefit of sprocket holes could become such an important factor in registering sound for motion pictures is certainly an unusual outgrowth of the development of this art. As soon as the effectiveness of quarter inch magnetic tape for normal sound recording was evident to motion picture directors, they immediately began to make use of it as a preliminary check on sound on location. As cue tracks, it was most useful. Now that absolute synchronism has been pioneered in its application by Rangertone, it becomes not just a standby or an intermediary, but the normal and most effective way of getting sound for motion pictures. The thin tape gives top quality easily because the tape hugs the magnetic heads without excessive pressure. The unique feature introduced by Rangertone is the use of a separate recording of a very small portion of 60 cycle power at right angles to the normal sound recording such that one does not interfere with the other. This right angle recording establishes the registry of the speed of movement of the tape with respect to the power which is driving the motion picture equipment at the same time. It may well be said that this constitutes magnetic sprocket holes for this thin magnetic tape.

**WHY MAGNETIC TAPE** - It may well be asked by this quarter inch magnetic tape has such a definite place in motion picture sound. The answers are, it is most economical and it does a better job. Playback on location is instant so that takes are assured as to sound, immediately. The dynamic range is also so great that the operator does not have to fuss with the controls to be assured of an excellent clean cut signal. Faithful reproduction is realized over the frequency range of 45 to 15,000 cycles. Anyone working in motion pictures realizes that the sound operation has been in many ways the most difficult. So now that the director can be given this assurance with immediate sound playback, an excellent combination has been established by means of which motion pictures can be more effectively and quickly realized.

**HOW IT WORKS** - On SYNCHRO an additional synchronizing record head puts down these 60 cycle synchronizing pulses whenever the operator desires them. This should be done when the motion picture cameras are rolling. If the sound and picture are recorded simultaneously, then the synchronizing pulses go on along with the sound. However, it is often advisable to photograph at one time and make the sound recording at another. Rangertone SYNCHRO is unique in this facility of permitting separate recording of the sound and the synchronizing pulses.

**DUBBING** - Magnetic tape is a natural for this type of operation where the picture is made first and the sound recorded when the picture is projected while the actors read their lines in step with the projected picture. The plan is as follows: A short loop of the pictures is made comprising a particular scene of a length of perhaps on half a minute. The actors observe the scene and then try their lines against it. The tape runs continuously forward while the loop repeats again and again and the voices of the actors are recorded on the tape. When a series of such takes is finished, the director and the cutting editor play the continuous tape back against the loop and pick out the best one or portions of two or more takes to make the best one. This is then re-recorded to film for the final editing. All of this functions so readily and effectively that it has been possible to do as many as forty loops in a single day using this process.

**POST SYNCHRONIZING** - The reverse operation is often undertaken in which the sound is made first and then this is played back for the action. In this case, no synchronizing pulses are put on the first tape recording; they are placed on the tape during the actual taking of the pictures when the take is being played back and the actors are accompanying the sound for the filming. If for any reason, the action is not perfectly synchronous, any portion of the scene may be retried photographically, and again taken for the new action. It is then readily possible for the cutting editor to splice together the various tape sections to produce a whole that matches the film nicely.

**SYNCHRONOUS PLAYBACK** - For establishing true synchronism on playback of this synchronous tape recording, the 60 cycle pulses are taken from the tape and amplified and compared with the 60 cycles then being used to drive motion picture equipment, either a film re-recorder or a projector. This comparison automatically adjusts the magnetic tape to make it play absolutely in step with the 60 cycles. As the film equipment is also in step with the 60 cycles, this insures that tape and film are moving together. Perfect lip synchronization is thus established. If for any reason, a good processing job is not first accomplished, it is of course easy to make a re-run from the tape.

#### EDITOR

In order to provide a very convenient method of comparing tapes and joining up one section with another, Rangertone has developed a two tape editor. This editor will play two tapes simultaneously with fader equipment to bring in one or the other. Separate descriptive literature in this unit is available.



## WHAT RANGERTONE USERS SAY:

Read These Actual Quotes From Letters on File:

"We wish to thank you for your assistance in the final recording of the track for our last General Mills film. The results were excellent and we all feel that it is the best track in our library."

"We were so pleased with our first Rangertone recording, that we have decided to produce subsequent pictures exclusively with Rangertone equipment."

"The recent performance of Rangertone recorders, in recording the Vienna Symphony in Vienna, produced the most realistic recording that I have ever heard. The entire frequency spectrum was reproduced completely free from distortion and unnatural peaks. Piano and oboe tones were exceptionally constant and clear. Congratulations on producing so fine an instrument."

"For film synchronization work, your Rangertone Tape Recorder has been in use here for several months. To say its performance is anything short of sensational, would be an understatement."

"In my opinion the Rangertone method of synchronous tape recording will soon make any other method of sound film recording obsolete."

"The Rangertone has paid off again. The first time we used your tape recorder was in the U. S. Army and Air Force Recruiting film, "Career Decision". There it took a lot of punishment, operating in the midst of explosions during sham battles, etc. "Lightning That Talks" was offered to us as a full dialogue film to be shot on location, and on a comparatively small budget. Your equipment made a great contribution toward the realization of our success."

1 May 1950

SPECIFICATIONS FOR RANGERTONE  
PORTABLE MAGNETIC TAPE RECORDERS

Frequency Response:	15"/Sec.; 45 to 15,000 cps $\pm$ 2 db 7-1/2"/Sec.; 50 to 8,000 cps $\pm$ 2 db
Distortion At Maximum Signal:	Less than 2% Total Harmonic
Maximum Signal to Tape Noise:	55 db
Maximum Signal to Hum:	60 db
Playing Time:	One Hour @ 15"/Sec.
Flutter (Peak to Peak):	Less than 0.1% @ 15"/Sec. Less than 0.2% @ 7-1/2"/Sec.
Tape Tension:	6 oz. inches (Constant During Play)
Absolute Playback Accuracy:	Without Synchronization; 0.1% With Synchronization; within $\pm$ 2 milliseconds of reference signal
Rewind Speed:	0 to 250"/Sec. in Fast Forward or Rewind Positions.
Input Level:	Into Recorder; +0 dbm @ 600 ohms Into Pre-Amp; -50 dbm @ 50 ohms
Output Level:	Playback Amplifier; 10 dbm 600 ohms

ADDITIONAL CHARACTERISTICS

Footage Counter - Time in Minutes and Seconds or Feel of 16 or 35 MM Film	
Operates Both Forward and Rewind	
Complete Monitoring and Mixing Facilities	
VU Meter, Signal Indicator and 8" Loudspeaker	
Excellent Editing Controls	
Continuously variable (0 to 250"/sec.) Fast Forward and Rewind Speed	
Dynamic Braking	
No Mechanical Parts to Wear, or Get out of Adjustment	
NAB Performance	
Meets all NAB Adopted Standards	
Long Playing	
Approximately five hours at 3-1/4"/Sec.	
Two Tape Speeds	
Choice of 3-3/4", 7-1/2", 15" or 30"/Sec. Tape Speeds	
Lip-Sync Recording	
Optional Feature at Slight Additional Cost	
Adjustable Bias Control	
May be Set for High or Low Coercive Force Tapes	
Built-In Demagnetizer	
Electric Demagnetizer for Demagnetizing Magnetic Heads	
Rugged Construction	
Portability But Not at the Sacrifice of Dependability	
Minimum Weight With Maximum Utility	
Tape Drive Unit	65 lbs.
Playback Amplifier (Includes Monitor Speaker and Pre-Amplifier	52 lbs.
Record Amplifier	37 lbs.
Prices: SYNCHRO	\$ 2025.00 Tape Drive Unit, Recorder and Playback Amplifier
SYNGHRON	2500.00 (Includes 3 Channel Low Impedance Pre-Amplifier)
SYNCHRONOUS	2750.00 (Above Plus Synchronous Recording)
Delivery: Six Weeks	



Rangoertone, Inc.

*Electric-Music*

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