Don't Destroy

INSTRUCTIONS

for

TRAVIS

TAPAK

BROADCAST EQUIPMENT SPECIALTIES CORP.
135-01 Liberty Ave.
Richmond Hill 19, L.I., N.Y.

HOW TO OPERATE THE TRAVIS TAPAK (tape-pack)

It is unusually important for the Tapak operator to familiarize himself thoroughly with the equipment before attempting production work.

Unpacking the Tapak

Examine carton for any evidence of unusual abuse in shipment. If any is noted, retain all packing materials as evidence for possible damage claims until Tapak is proven to be ok.

Remove Tapak from carton being careful not to discard any parts in the package.

Open the Tapak cover and carefully remove stuffing and any parts which are wrapped inside. Check that you have the following parts:

Microphone
Earphone with band
Erase head (permanent magnet)
Carrying handle (converts to winding crank)
Leather carrying strap
Pen flashlight
Key
Any extras ordered

Be sure to remove stuffing from under take-up reel flange (the aluminum disc with the red circles on it).

Note how microphone and headphone are installed in cover so you can remove and replace them the same way. See illustration.

Install pen flashlight in hole of cover. See illustration.

(A) In the interest of flexibility in functions performed and in consideration of the limitations of spring wound power and dry battery amplification the Tapak necessarily differs considerably from conventional recorders in respect to the nature and operation of the controls. Thus complete familiarization is of utmost importance.

FAMILIARIZATION

Winding the Tapak

The tapak carrying handle converts into the winding crank thus eliminating the need for removing and reinstalling, and the possibility of loss. To convert the handle, simply push the pivotable knob on end of the handle out of the "U" shaped bracket atop the case, and swing the knob upward until it snaps (See Illustration). The handle will now wind the spring motor. Crank clockwise looking down until strong resistance begins to indicate a fully wound condition at which time approach the end slowly but continue cranking until a solid limit is reached. There is little likelihood of breaking the spring if even a modicum of care is exercised. The knob may be left up for further cranking if the Tapak is not carried by the handle in the meantime. DO NOT, HOWEVER, CARRY THE TAPAK BY THE CRANK UNLESS THE CRANK IS CONVERTED TO A HANDLE BY LATCHING THE KNOB BACK INTO THE "U" BRACKET. Rough handling by the crank may shift the spring motor mount and make readjustment of the drive necessary. The crank may be reversed with a little effort if it cannot be brought around to latching alignment in the clockwise direction.

Forward Drive Mechanism

For familiarization it is best to stand the Tapak upright (handle on top) on a table with cover opened or removed. For most purposes this is the most convenient operating position. On the left is the supply-reel spindle and hub which holds a standard 5" reel of plastic base, red oxide tape, "A" wind (dull side of tape faces hub of reel). Near the center of the face-panel is the capstan almost two inches in diameter with a stroboscope etched on its face. This normally rotates at 78 RPM, and is the driving power for forward motion. To the right of the capstan at the end of the aluminum bar with the grooves in it (the control arm) is a free-turning rubber-tired idle wheel. Further to the right is the take-up hub with its flange faced with concentric red circles.

It is important to remember that this take-up reel hub is completely free running on ball bearings when the rubber-tired idler wheel is disengaged. Now, place the control arm in a position where the rubber wheel is elevated away from the take-up reel if it is not already in this position. Spin the take-up reel hub and flange by hand. It should coast for a good part of a minute. To remember that this hub and flange assembly coasts is important because there is one circumstance in re-winding under which failure to manually brake this coasting may cause tape spillage.

The take-up reel hub and flange assembly, in addition to rotating, is also free to move from left to right against a moderate spring pressure. Demonstrate to yourself by manually pushing it to the extreme right to feel this action. The motion takes place slowly during recording as tape builds up on the hub, pushing it ever farther away from the rubber idler wheel. The spring pressure is such as to prevent any possibility of slippage of the rubber wheel against the tape without, however, creating undue friction from side-loading of the rubber-wheel bearing. The drive without tape can now be demonstrated by lowering the idler wheel with the control arm to where it snaps into engagement with the take-up reel hub and the capstan. If the motor is wound, the capstan will drive the rubber wheel which in turn will drive the take-up hub and flange. The entire "forward" power train is now operating before your eyes. There is nothing out of sight.

Control-Arm Position Indicator

By now you have noted how to move the control arm. You may have noted that when the rubber-idler-wheel end of the arm is swung downward so as to drive the take-up reel hub, the left hand end of the arm swings upward to a position indicated by a large green dot. In traffic-light parlance this position, of course, indicates "go" (In other words, "drive-tape forward"). Swinging the right end of the control arm upward one notch, moves the left end downward to indicate red, meaning "stop". This applies only to stopping the capstan, which indeed it does. THIS POSITION IS USED ONLY FOR PUTTING THE TAPAK AT REST AFTER UNTHREADING OR AFTER RUNNING OFF A REEL. It is not a control for stopping and starting during intermittent recording. Mechanically, it is simply a brake on the spring motor so it will not run down when not in use.

Reverse Mechanism

The right-hand end of the control arm may be still further raised to a notch which makes the left hand indicator show yellow. Since yellow commonly means neither go nor stop, it is (by default) used here to indicate rewind position. Leaving the control arm in this yellow position, note the small lever at extreme left near upper corner. Raise this lever all the way to demonstrate to yourself that the supply reel hub rotates rapidly in counter-

clockwise direction. All this, of course, assumes that the Tapak is wound up as determined by whether the capstan is rotating. Now, lower the lever fully and note that the supply reel hub stops rotating. This lever is called the rewind engager. Note that the hub of the rewind engager has a green and a yellow position. When both the lever and the control arm are set yellow, rewinding will take place, otherwise not. (When both are set at green, the tape will move forward, otherwise not). The rewind engager must always be at one extreme or the other, not in a mid-position.

The actual rewind mechanism is out of sight behind the panel. It consists firstly of a large (6" diameter) flywheel on the capstan shaft which runs, of course, at 78 RPM whenever the capstan is turning. Secondly, there is a small rubber-tired wheel on the supply reel shaft. When these two are brought into frictional engagement by raising the engaging lever, the supply reel shaft is rotated at a stepped-up speed in reverse direction. It can be noted by close watching that raising the engaging lever moves the supply reel hub slightly to the right. This is the action that produces the frictional engagement for rewinding.

Thus, in order to reverse, two motions are required: (1) Raise rewind engager to its stop; (2) Raise right end of control arm fully, (passing through red position into yellow). When actually rewinding tape it is desirable to grasp the take-up reel thumb screw with the right hand while shifting the control arm with the left hand. This procedure avoids a "kick" which might make the tape come off the guides.

Threading the Tapak

Now we are ready to thread tape. Have Tapak vertical with handle upward (for purposes of this description only; any position is OK after you have the hang of it). Remove knurled screw from supply reel hub (left side of Tapak). Install 5" reel of red plastic tape (wound"A", oxide in) so that tape pulls off upward from left. Replace screw. Put control arm at "red" if not already there. (This holds motor stopped). Raise rewind engager lever to its stop. (This applies friction hold-back to supply reel by engaging reverse drive while motor is stopped). Thread tape upward to the left and over the grooved tape guide-post above the reel. Then pull tape horizontally to the right over the magnetic head, over right hand tape guide, and thence downward to the right side of the take-up reel hub. Insert the tape edgewise into thin slot in the take-up reel hub pushing it in past the flange. Now, carefully hold the tape against the hub with the fingers while rotating the hub clockwise about one turn until the tape overlaps itself. Then while keeping the tape tight by clockwise rotational pull with the right hand, lower the control arm to "green" so that the rubber idler bears against the tape.

Be sure the tape is squarely in the slot, not pulled out sideways as in threading conventional reels. Do not double tape as with NAB reel. Minimize bump due to overlap. A good square start assures most perfect winding.

You are now in green for "go" with the control arm, but the rewind engager lever (upper left) is on yellow.* Now "release" the rewind engager lever downward to green position (against pin) and the tape will drive forward. You can now see the Tapak drive at work. Note that the tape is pinched between the take-up reel hub, and the rubber tired idler wheel while it is being pulled over the head.

It is sometimes asked how such a mechanical arrangement can result in substantially constant tape speed from beginning to end of the reel. The explanation, while not always immediately obvious is simply a matter of the mechanics of idler wheels.

*Rewind engager has small green and yellow indicator to right of its hub.

First, consider the capstan. The diameter of the capstan is such that when turning at 78 RPM, any given point on its periphery is moving in a circular path at 7½" per second. The rubber-tired idler-wheel when in frictional engagement with the capstan must perforce be rotated so that any point on its periphery is likewise being moved at 7½" per second. (This would hold true regardless of the diameter of the idler wheel used). Since, in turn, the back side of the tape is in firm frictional contact with the rubber-tired idler, it too is being moved at 7½" per second. Failure to visualize is generally the result of thinking in terms of RPM of the rotating members. RPM should be disregarded, the whole matter is one of peripheral velocity. As long as the Tapak is within the running-time limit, the tape will travel at 7½" per second, plus or minus abour 1½% maximum error.

Speed Control

Speed adjustment should not be necessary except after hundreds of hours of use, or if it is desired to adjust to match a studio recorder that may run slightly slower or faster than 7½"/sec. (a common occurrence). It is accomplished, however, as follows:

A stroboscope is provided on the capstan. When viewed under 60 cycle AC light, preferably flourescent, the stroboscope marks will appear stationary at 78.26 RPM.* Test should be made with Tapak actually driving tape rather than running free. With the Tapak tightly wound, a barely visible creep of strobe marks in the clockwise direction is desirable as they will tend later to retrograde slightly as the run down condition is approched. For speed checks in the field a dot is provided on the strobe face for timing with a watch second-hand.

To adjust speed remove plug slightly to right and above capstan. Stop motor. Insert a screw driver through plug hole into slot of governor control shaft and turn as slightly as possible. If flywheel spoke interferes, turn capstan slightly by hand. Start motor and check speed again. Repeat process on trial and error basis. The adjustment required for a considerable speed change is so little as to be barely feelable with the screw drive.

Operating The Tapak Drive

With the Tapak still in the vertical position and wound up, the tape will be driving forward so long as the control arm is on green and rewind engager down. As tape builds up on the take-up hub and flange, the tape diameter will grow to where it reaches the first concentric red circle. It is then time to recrank the Tapak (1 min. max. reserve) which may be done without disturbing tape speed. Simply hold down on the left top of the case with the left hand while cranking smoothly with the right.

Intermittent Operation

The Tapak drive may be stopped at will by just one motion, raising the rewind engager lever. No change is made in the position of the control arm. It will be noted that tape stays tight when stopped in this manner. The Tapak can be carried and handled quite roughly in this condition without any danger of tape spilling or becoming loose. This is because having left the control arm in "go" (green) the Tapak is trying to drive tape forward while the rewind engager lever has applied reverse effort to the supply reel. The two opposing forces keep the tape tight. To start the drive again, one has only to "release" (lower) the rewind engaging lever to the pin. The drive will be on speed again in about 3 seconds.

*Correct RPM for 7½" per sec.

Operation With Cover Closed

It is noteworthy that the rewind engager, which as explained above, acts as a stop-start control for intermittent recording, projects over the left edge of the Tapak case. The Tapak cover has a cut-out at this point to permit one-finger operation of the rewind-engager-lever from outside. Thus, once the microphone and headphone are removed from inside the cover, the cover can be slipped onto its hinges and closed. Assuming that the Tapak has been threaded, wound, and a few turns of tape built up on the take-up reel hub, it can be carried anywhere covered, and ready for instant use without threading delay. All that is necessary, to repeat, is to leave the control arm at green while the rewind-engager-lever is left up (yellow). The low drain amplifier is simply left turned on and the gain set for average (4-5).

Erasing

The step-flux permanent-magnet erase head may best be considered as emergency erase. It is best practice to use pre-erased tape. When it is desired, however, to erase tape before recording, simply remove the head from its parking place (upper right) and install in the clip at upper left of control arm making sure it is fully down into the clip. See illustration. It will stay in this position in spite of rough handling because of its strong magnetic attraction to the clip. Side to side alignment with the tape is not in the least critical. The angle of tilt, however, has a decided bearing on the noise level, but is not fussy. The clip is factory-set to a satisfactory angle, but it can be reset or checked by springing the clip upward or downward while listening to the noise during playback. Bend to quietest angle if necessary. Tape is not intended to contact all four teeth,* should touch only the left hand two. IT IS ABSOLUTELY ESSENTIAL THAT TAPE RIDES FULLY ON SECOND POLE PIECE FROM LEFT AND THAT SCREW HEADS ON ERASER FACE OPERATOR, OTHERWISE RECORDED LEVEL WILL BE USELESSLY LOW. The eraser must be removed to its parking place before playing back, or it will erase the new recording too. The eraser cannot, however, accidentally erase during rewind as it drops down when control arm is shifted.

Operating the Tapak Amplifier.

Remove the mike and phones from cover and plug into jacks on right hand end of Tapak case. Turn switch (upper right corner of panel) to RECORD. Speak to microphone with normal conversational voice at a distance of 6 to 8 inches or at any distance to which you are accustomed. Set volume (gain-control knob just below switch) to minimum point that will flash neon light (left upper corner) occasionally on loudest peaks of sound. Neon indicator should flash only on every second or third word, not continuously. This is correct recording volume. Put on the earphone and you will hear yourself talk. Recording volume can of course be varied to suit conditions.

More distant pickup such as might be needed when a number of people talk at a conference from various points in a room requires more gain. Loud background noise such as an airplane engine requires reduction in gain and very close mike placement. The neon indicator discloses only total level, but a quick playback of a short patch is the surest test under unusual conditions. Distortion (unlifelike sound) indicates overloading (too much recording volume). The distortion may come from the background noise more than the voice, so under extreme conditions reduce volume as much as possible consistent with indicator flashing while talking almost against the mike, and try to avoid blowing into mike. Talking <u>over</u> horizontally held mike may help.

* Pole pieces.

Normal voice-recording volume setting will be between #4 & #5. Immediately upon stopping the tape after recording switch amplifier to PLAY, otherwise recording will continue during rewinding and be superimposed on the desired recording thus spoiling the quality. Switching to PLAY also makes possible listening to the recording in reverse so that you can hear the beginning of your passage and stop the rewinding at the right time.

The volume control also operates in PLAY back, but do not try to use phone for a loud speaker, or it may not reproduce with clarity. Volume setting #5 to #6 is enough.

BE SURE TO SWITCH TAPAK OFF when finished. (A pilot light is not pratical with dry batteries.)

Battery Indicator

The neon flasher doubles as a battery condition indicator. If using normal voice at normal mike distance unusual extra volume (gain) is required to make indicator flash, the battery voltage has become low.

High quality recordings can still be made, but the batteries should be replaced at the first opportunity. Slightly higher recording volume may be desirable, but raising volume until flashing occurs may overload.

The A cells deteriorate first and should be changed on general principles. If flashing becomes normal with new A cells, B battery is OK. If not change B battery too.

Batteries

Since the tape motion is powered by spring motor, dry batteries are used for the amplifier only. Batteries may be changed through the battery door when the Tapak is laid down flat with winding handle away from operator.

"A" power (Filament heating) is supplied by two standard flashlight cells, obtainable practically anywhere. Any of the following common numbers will serve:

Burgess #2 R
Eveready #1150
RCA VS 036

"B" power (plate) is supplied by a 67½ volt B battery. Any of the following will serve:

Burgess XX 45
Eveready 467
RCA VS 016

The A cells must be installed with the carbon buttons out. The B battery is connected by male and female snaps to insure correct polarity. The amplifier is inoperative with the door open because the positive contact is on the door. Since it is sometimes desirable to check the B battery voltage under load it is noteworthy that the battery door can be closed with the B battery outside. The cord is simply allowed to come through the left hand door crack. When replacing the B battery tuck in its cord so it will not go back into the case to tangle with the mechanism.

Operating the Fast Rewind

Upon completion of recording a reel of tape or a patch when the tape has not all run off the supply reel, stop the tape drive by raising the rewind-engager-lever sufficiently toward "yellow". If the tape has run off the supply reel, stop the motor by setting the control arm at "red". Rethread the

tape in reverse direction over the same path as for recording with left hand while keeping take-up reel tight with right hand. Give it a turn or so by manually rotating supply reel, then raise rewind-engager-lever toward "yellow". Put amplifier switch to "Playback" (for listening, otherwise "off") and shift control arm counter-clockwise to "yellow". Wind motor tightly because, since it is driving at a high mechanical disadvantage, it needs maximum torque. If rewinding does not begin immediately, release rewind-engager-lever downward slightly till capstan starts to turn, then move it upward just enough to start supply reel turning counter clockwise. Rewinding will pick up speed in a few seconds to about 360 ft. per minute. The take-up reel hub and flange are now rotating freely with no braking whatsoever. If therefore, it is desired to stop rewinding before completion or at a particular bloop (cue). STOPPING THE REWINDING MUST BE DONE BY MANUALLY STOPPING THE TAKE-UP REEL (GRAB THUMB SCREW). OTHERWISE, as cautioned previously, the free-coasting take-up reel will SPILL TAPE VIOLENTLY. Therefore, when approaching a cue, be ready to stop the take up reel (right side) BY HAND ONLY, and it will often help to slow the rewinding by keeping a finger-brake on the thumb screw well before reaching the desired stopping point. NEVER RELEASE THE REWIND-ENGAGER-LEVER (DOWNWARD) UNTIL YOU HAVE STOPPED THE TAPE BY BRAKING THE TAKE-UP REEL AS ABOVE. LIKEWISE, DO NOT SHIFT THE CONTROL ARM UNTIL YOU HAVE BRAKED THE TAKE-UP REEL TO A STOP BY HAND (or the tape is completely rewound).

Having thus stopped the rewinding at some point by stopping the take-up reel, leave the rewind-engager-lever still engaged (up), keep tape tight with right hand while shifting control arm to "go" (green) with left hand. You are now ready to playback immediately upon release of rewind-engager (downward, green). At this point, if the erase head should still be in the clip, it must be removed to its parking place (so it can't become mislaid). Otherwise, it will erase ahead of playback, and no signal will come through. It will be noted that the erase head can safely be left in the clip during rewind, as it will automatically drop down below the tape path when the control arm is shifted to rewind (yellow). It is best to remove it sometime during rewind, however, as during that period there is ample time to anticipate the playback procedure.

Experience shows that ten minutes practice (compared to pages of verbiage) is all that is required to make the Tapak drive forward, backward, or hold at a point.

Editing

It will be noted that the polished face of the control arm is machined with a tape groove and a 45° crosswise groove. For editing, remove the cover and rest the Tapak in a horizontal position with the winding crank facing you. Bring the Tapak to the near edge of a table or suitable support so that there is room to wind the crank without bumping the table surface. Leave the amplifier switch on Playback, and be sure the erase head is "parked". Run the tape backward or forward as desired while listening on the headphone for the starts and stops of patches. Turn either reel by hand to locate exact cues. When a cut is desired, lift the tape off the head and insert in tape groove on control arm. Cut through 45° groove with razor blade and proceed according to general splicing procedures as described in Scotch Tape boxes.

As previously cautioned, do not let the tape spill by shifting any controls once high speed rewind has started. ALWAYS STOP THE TAKE-UP REEL BY HAND FIRST (the left hand reel when in this position) then shift controls as desired. When re-engaging forward drive, always be sure tape is tight. If a wrinkle is seen in the pancake wind, stop supply reel with right hand and hold. Then turn take-up reel (on left) clock-wise with left hand, at same

time move it to left away from rubber idler and let it return against idler when tape is tight. Then release supply reel.

Tapak Questions and Answers

Q. Why is the take-up reel open-flanged?
A. Because an outer flange would block any possible way of supporting the rubber idler wheel.

Q. Why does the tape sometimes cone-up on the take-up reel and wind irregularly?
A. Some batches are sheared crooked so the tape is slightly longer on one edge than on the other. Try a different reel of tape. We can supply tape that is sheared straight. Tape may also be wavy from having absorbed moisture during humid weather. It may look funny, but will work okay. Try to store tape in a drier location.

Q. Why does the tape sometimes get a slight loop behind the rubber idler wheel?
A. Because the tape was loose when the control arm was swung to green. Keep tape tight by leaving rewind-engager-lever up while setting control arm to green and keep hold of take-up hub thumb screw while shifting arm.

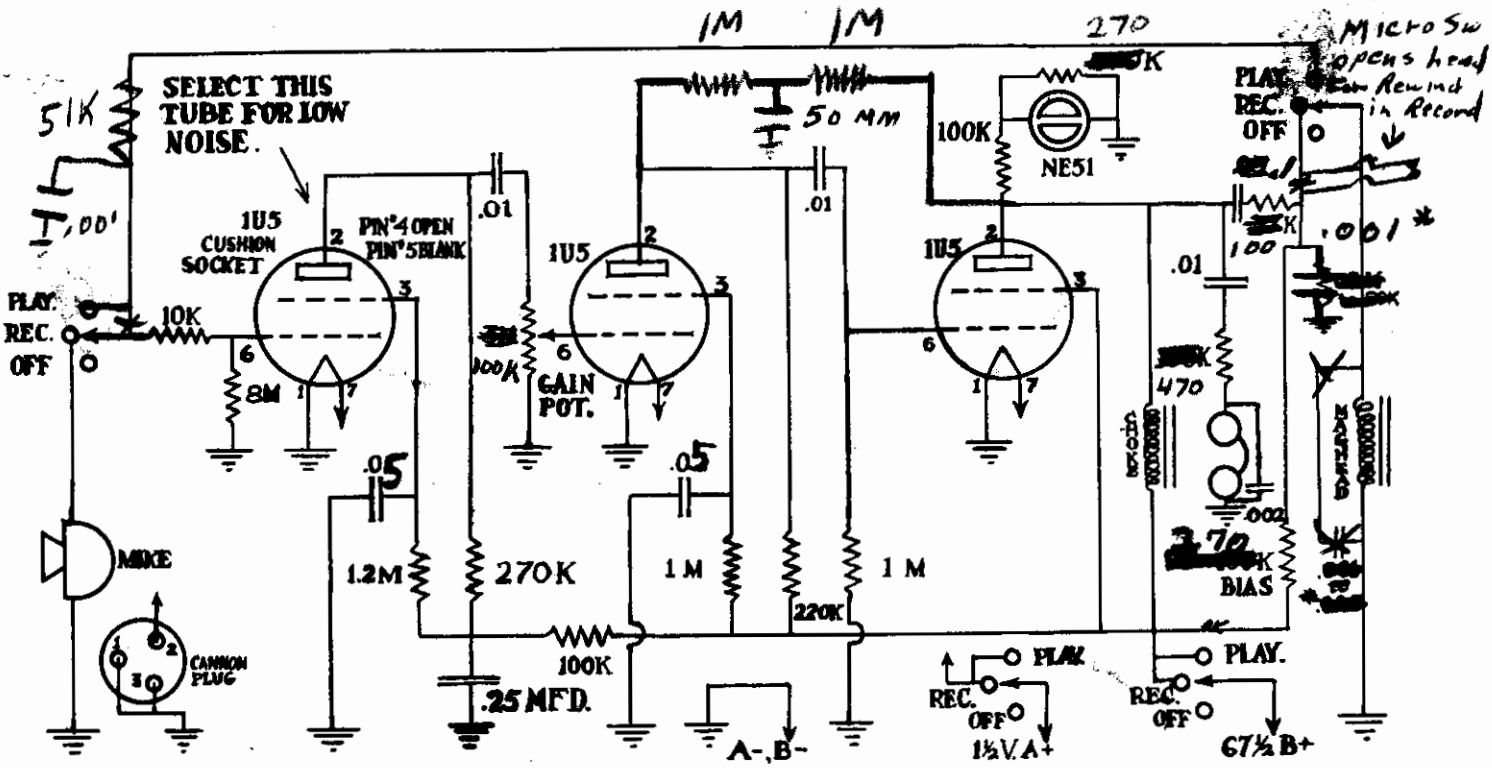
Q. What makes "hash" on the tape?
A. Leaving switch at "record" while rewinding. Switch to "playback" or "off". Also, extraneous noise is often picked up by mike that goes unnoticed to the ear because the mind shuts it out. This is common on "location", rare in studio. Minimize by getting subject very close to mike and reduce gain accordingly.

Q. What causes violent "WOWS"?
A. A glazed or greasy rubber idler wheel and grimy capstan. Clean rubber tire and capstan with rag dampened with carbon tetrachloride, lighter fluid (or gasoline), but do not soak rubber nor wet it for long, as it is not neoprene, but high-friction gum rubber. Clean both rubber and capstan until rag picks up no more discoloration. Also check friction adjustment. Correct by turning screw with red dot just above erase head mount. 1/8 to 1/4 turn clockwise is usually sufficient. See illustration for details.

Q. Why do I have to use so much gain to make the neon lamp flash?
A. Suspect the batteries of being low if you are testing at usual voice volume at usual distance from mike. Gain at about #5 should flash it.

Q. Why does tape get slack when I throw the control arm to rewind (yellow)?
A. Because it gives take-up reel a little rotary kick. This usually takes up immediately, but if it bothers, twist take-up reel thumb screw clockwise with right hand while engaging control arm with left hand.
Tape may always be tightened by manually turning one reel opposite to other. Once tight it should stay so.

Q. If a few turns of tape inadvertantly come off of the take-up reel, what is easiest way to put them back?
A. Don't try. Remove supply reel with left hand while holding outside tape layer tight on take-up reel with right hand. Flip supply reel over sufficient times to take twist out of tape and reinstall supply reel pulling tape over record-head and guide post.



TapaK

BROADCAST EQUIPMENT SPECIALTIES CORP.

AMPLIFIER

K3 SERIES

* RESONATES HEAD

REVISIONS FOR BRUSH 1090 "RED HEAD". OCTOBER 1953

ONE QUARTER TURN OR LESS OF SCREW WITH RED DOT ADJUSTS FRICTION BETWEEN CAPSTAN AND RUBBER TIRED WHEEL. ADJUSTMENT IS CORRECT WHEN MANUALLY STOPPING RUBBER WHEEL STOPS CAPSTAN IN ABOUT 1/2 REVOLUTION. KEEP RUBBER CLEAN WITH CARBON TETRACHLORIDE -- NO PETROLEUM PRODUCTS.