5. Function of BE operating terminal controls

The vertical row of meters divides the front panel of the operating terminal into three sections.

The field to the right of the meters programs the disk parameters.

The field to the left of meters controls the actual cutting process.

The three read-outs at the upper left-hand side form the control indicator section.

1. RPM 33 1/3 push button
Button to select the turntable speed 33 1/3 RPM, When pushing this button, it automatically triggers the turntable diameter functions 12"(30) and the standard end diameter 106 mm for LPs.

2. DISK DIA 12"(30) push button
Button to program the outer disk diameter 12"(30cm). May be operated after pressing any speed button and then automatically triggers the standard LP end diameter button.

END DIA LP (106 mm) push button
Button to select the diameter of the concentric end groove for a standard LP. May be operated after pressing any speed and diameter button. When power of the VMS 80 is turned on it automatically triggers push buttons 1, 2, and 3, i. e. the machine is initially programmed to

...5. cut standard LPs. Other cutting programs must then be selected by pressing their respective push buttons.

4. RPM 45 push button
Button to select the turntable speeed 45 RPM. It automatically triggers the disk diameter 7"(17cm) and the singles end diameter 98 mm.

5. DISK DIA 7"(17)
Button to program the 7"(17cm) disk diameter. May be selected after pressing any speed button and triggers the end groove diameter for singles(98mm).

6. END DIA 98 (singles) push button
Button to select the 98 mm concentric end groove diameter for singles. May be operated after selecting any disk speed and outer diameter.

7. DISK DIA 10" (25) push button
Button to program the 10"(25 cm) disk dia. May be operated after selecting any turntable speed.

8. RPM HALF SPEED push button
Button for the half speeed of 33 1/3 and 45 RPM: 16 2/3 and 22 1/2 RPM respectively.

Control elements which need not to be operated so often are combined on a recessed panel which protects against inadvertent operation.

...5. 9. LEAD-OUT (SECOND DEPTH) toggle switch
Switch will be operated if a different cutting depth is desired for the lead-out groove. The lit green LED above the switch indicates that the lead-out groove will be cut with different depth.

10. MARKER (SPIRAL)(SECOND DEPTH) toggle switch
Switch to program different cutting depth for the marker grooves (spiral). The lit green LED above the switch indicates that the marker grooves (spirals) will be cut with different depth.

11. LEAD-IN (SECOND DEPTH) toggle switch
Switch to program different cutting depth for the lead-in groove. Refer to description items 9 and 10.

12. SAFETY GROOVE 33 1/3 toggle switch
When switched on (green LED lit) will cut a safety groove ahead of the lead-in grooves for 1.4 revolutions at basic pitch.

13. SAFETY GROOVE 45 toggle switch
Same as item 12, but for 45 RPM (and 22 1/2 RPM respectively).

14. TEST (PITCH AND DEPTH CONTROL) toggle switch
Is intended to check the pitch control. When on, the adjacent red LED and the selected DIA button flash to indicate that the equipment is

...5. not ready for normal disk cutting. The functions LEAD IN and ADD LAND are inoperative. In the varigroove computer the phase recognition is inoperative, thus controlling groove spacing only according to the peak envelope curve.

15. FIXED AND AUTO toggle switch (PITCH + DEPTH CONTROL)
Position FIXED: yellow LED is lit. The varigroove computer is switched off. the VMS 80 cuts with manually preset pitch and depth.
Position AUTO: green LED is lit, pitch and depth computer is in operation.

16. MONO and STEREO toggle switch
Position MONO: yellow LED is lit. A monophasic signal only has a lateral and no vertical component. Nevertheless it is often desirable to cut a greater depth at higher lateral amplitudes for better stylus tracking. An artificial depth signal is derived from the left-hand channel for this purpose.
Position STEREO: green LED is lit. Varigroove computer operates normally both in lateral and vertical direction.

17. MONO DEPTH potentiometer
Adjustment of the amount of the artificial vertical component used, as described in item 16.

18. TEST DAMPING toggle switch
Switch to optimize the damping of the dash pot of the cutterhead suspension. When switched on,

...5. the adjacent red LED flashes to indicate that normal cutting of program material is impossible. A 2.17 Hz signal (the flashing frequency) is superimposed on the depth control signal in such a way that it is switched periodically from a 40 µm (1.6mil) depth to a value preset by the BASIC DEPTH (30) potentiometer. By observing the groove depth oscillations produced using the microscope, one may optimize the dash pot position.
Set the BASIC DEPTH (30) potentiometer to a value of 150 µm (6mil) (Meter 32) and cut a test groove, while varying the dash pot damping slightly (see chapt. 3.2.). If the damping is too low, you will observe an oscillation of the groove width for each depth change. If it is overdamped, there is no oscillation, but the groove edge will not be straight. The optimal dash pot position lies in between both settings described above. It is recommended that the test cut be evaluated while rotating the turntable forward and backward by hand, selecting a speed which gives the clearest impression of the image.
The field to the left of the meters is for the control elements for actual cutting.

VACUUM push button
Activates the vacuum for chip removal and the turntable vacuum chuck. It is lit when on, pushing it once more switches vacuum off.

...5.

20. TURNTABLE push button
Starts and stops the turntable drive motor. Upon actuation the turntable motor starts and the push button light flashes until the motor has reached speed. It then lights continuously. Only when the turntable is running at its nominal speed can the cutterhead be lowered onto the lacquer. If the turntable speed is disturbed even for a short time, the TURNTABLE push button light flashes until the turntable has resumed its nominal speed (this may be the case when inadvertently touching the turntable). While cutting, the cutterhead would be lifted automatically under this circumstance, since the cut is spoiled anyway.
The turntable is stopped by operating the TURNTABLE push button a second time.

21. STOP push button
When lit it means that the pitch drive in inoperative. In this position the carriage may be moved either by rotation of the knurled spindle wheel (normally not necessary) or by means of the carriage servo switch.
If the VMS 80 is in either its START, FAST or MARKER (SPIRAL) mode, then pressing the STOP button ends this operation in the following way:

a) <u>If the cutterhead is positioned outside the 14" diameter:</u> the pitch drive is stopped immediately.
b) <u>If the cutterhead is lowered at a position inside the 14" diameter:</u> (i.e.cutting position): the pitch drive stops immediately, but the

...5. cutterhead remains down, cuts a concentric groove and then lifts. In addition, the VMS 80 sends a remote stop order to the tape deck.

Function Overload

If the pitch drive is overloaded for any reason (if running against an obstacle), the overload circuit prevents it from being damaged by switching off the pitch drive motor and lifting the cutterhead immediately (without cutting a concentric groove). The overload function is indicated by flashing of the STOP button. It may be cancelled by operating the STOP button. The VMS 80 is then again in its stop position.

22. START push button

Activates the normal pitch drive and is lit, while the STOP button extinguishes. Pressing the START button also serves to terminate FAST or MARKER (SPIRAL) operation.

23. FAST push button

May only be operated when the machine is in START mode (i.e. when the pitch drive is operating). It activates the fast pitch drive for the lead in or lead out grooves and it is lit when in that mode.

24. MARKER (SPIRAL) push button

May only be operated when the pitch drive is on. It activates the spiral pitch for a period of time

...5. which is to be selected at the selector switch(25). It also is lit when the marker (spiral) function is triggered from the tape machine light barrier. The marker operation may be terminated by the START button.

25. MARKER (SEC) rotatry switch
Adjusts the duration of the marker groove (spiral) over a range of 0.3...3.6 seconds. When rotated fully clockwise, the marker spirals continuously and may only be stopped by the START button.

26. CUTTER OFF push button
It lifts the cutterhead electro-mechanically and disconnects Neumann cutterheads from their amplifiers. The push button lights.

27. CUTTER READY push button
Connects the Neumann cutterhead to its amplifiers, even when the head is up! If the cutterhead was cutting previously (CUTTER DOWN), then pressing the CUTTER READY button will lift it to a position just above the lacquer surface.

28. CUTTER DOWN push button
Lowers the Neumann cutterhead to the lacquer under the following conditions:

a) the operating lever at the cutterhead suspension is down;

b) the cutterhead is positioned at a dia-

...5. meter smaller than 14", the pitch drive runs, and the turntable rotates at its nominal speed.

If one of these conditions is not fulfilled, the machine goes into the CUTTER READY mode and the CUTTER DOWN button flashes.

29. LAND potentiometer
Land adjustment:
The adjusted land is not influenced by the BASIC DEPTH setting.

Note: A slide switch is located on the RAS PC-board, marked LAND x 3. If it is down, land is increased by a factor 3. This function is not indicated on the LAND meter (30), but only on the PITCH meter (36). Should the readings of meters (30) and (33) not add up to the reading of meter (36), check the position of this switch!

30. LAND meter
It indicates the adjusted land.

31. BASIC DEPTH potentiometer
Adjustment of the quiescent cutting depth.

32. SECOND DEPTH potentiometer
Setting for a second cutting depth which may be selected separately for lead-in, marker(spiral)

...5. and lead-out grooves (see chapt. 5.9 to 5.11). To set and test, the potentiometer is to be depresses (push to test). During program cutting, the knob (32) has a second function: when pressing it momentarily basic depth is indicated for a period of about 10 seconds rather than momentary depth of cut.

33. DEPTH meter
Indication of depth of cut. A result of the setting according to 31 and 32 plus the vari-groove depth control.

34.▽ADJUST potentiometer
Adjustment to align the actual cutting width to the meter indication. To do this, set the meter by means of the BASIC DEPTH pot to the ▽marker which equals 40 µm (1.6 mil). Then make a test cut and measure groove width using the microscope reticule. Adjust groove width cut by means of potentiometer 34 to 40 µm(1.6mil).

35.▼ADJUST potentiometer
Adjustment to align the actual cutting width to the meter indication. Alignment as described in item 34, but at the marker▼ equal to 150 µm (6 mil). After item 35 has been completed, repeat item 34

...5.

36. PITCH meter
Indication of the instantaneous pitch in lines per inch (LPI) and mils per rotation. In addition the meter has two other scales to indicate the marker (spiral) and fast pitch in mils per revolution. LEDs are provided to indicate which scale is operative.

37. BASIC HEAT potentiometer
Setting of the stylus heating current. To check and for to set press the knob. Make sure that the carriage is either in its right end position or that the INCREASED HEAT potentiometer (38) is in its counterclockwise position when doing this.

38. INCREASED HEAT potentiometer
Adjustment for stylus heat increase when the cutterhead travels toward the center of the disk. If such an effect is not desired, the potentiometer must be turned into its full counterclockwise position. Press knob for setting job.

39. HEAT meter
Indicates stylus heating current. Indication can only be observed when pressing knob 37 or 38 and/or while cutting.

40. TEST DIA push button
Causes the carriage to run to the test diameter position. It lights while running.

...5.

41. CUT SELECTOR rotary switch
Selector switch for automatic banding control. Selects the number of cuts desired. Indication see chapt. 5.43.
Position 1 to 18
After the preselected number of titles has been cut, the machine automatically cuts the lead-out groove and generates a remote stop signal for the tape machine.
CONT (continuous) position
In this position of the switch, marker grooves are cut until lead-out is cut by pressing the FAST button. There is no remote stop signal for the tape machine.

OFF position
There is no automatic banding and no digital indication.

42. TOTAL CUT IDENT push button
Push button to allow checking the preselected number of titles (CUT SELECTOR 41) during the cutting process. Before cutting starts, the digital read-out shows the number of titles selected by means of the selector switch 41. During cutting, the digital read-out 43 shows the number of the title being cut. The difference in the read-out of these numbers is indicated by a dot after the cut in progress. If one wants to read the preselected total number of titles during cutting press push button 42.

...5.

43. CUT NUMBER read out.
Read out of the automatic banding unit. Indicates in the pitch STOP (21) mode the total number of titles selected at the CUT SELECTOR (41). When the CUT SELECTOR is in the position CONT, and PITCH in the STOP mode, it shows the figure zero.
When the drive is in its START (22) mode, the read-out shows the number of the title in progress with a dot after the figure.
When the number of selected titles is reached during the cutting process, the read-out flashes to indicate that the last title is being cut and the lead-out will follow with the remote stop for the tape machine. While the read-out is flashing, it is still possible to change the total cut number(41 and 42) for a higher one.
The read-out CUT NUMBER is blank when the CUT SELECTOR(41) is in its OFF position.

USED % read-out
Two-character digital read-out of the percentage of available record radius which has been cut at any given moment.
It starts counting after cutting the selected lead-in groove (push buttons 2,5 or 7) and it reaches 100 % at the end of modulation groove diameter. The counter is adjusted at the factory in such a way that o %=0 to 100%=00 correspond to the percentage scale of the lathe carriage ruler. If necessary, one may electronically align a different position for the 100% indication by

...5. adjusting the corresponding trim pots for each of the three end diameters on the SPS 80 PC-board.

45. STYLUS HOURS read-out
Elapsed time counter for the stylus operating hours. The counter is triggered by the stylus heat which is actually activated only when the stylus is cutting. It therefore shows the actual cutting time. A built in nicad cell provides counter memory even if the machine is switched off. To reset the counter (when replacing the stylus) push the small reset button in the read-out panel by means of a suitable tool, such as a ball-point pen.

46. ADD LAND push button
Increases the pitch to suppress groove echos. When pushed it flashes until pushed a second time, but not exceeding the number of turntable rotations which have been selected by means of the S1 switch on the VAS PC-board in the range of 1 to 5 turns (see chapt. 4.6.1.).To increase the ADD LAND time even further, press the ADD LAND button as long as the function is desired. The ADD LAND function is also triggered from the automatic tape light barrier (see MARKER, 5.(24)).

47. ADD LAND potentiometer
Setting the pitch increase (46). The increase of land is indicated on the LAND meter. When in full counterclockwise position, there is no land increase and the ADD LAND mode is off. Under this circum-

...5. stance there is also no flashing light indication at the push button (46).

48. MICROSCOPE push button
Activates the microscope light and is then lit. The microscope lamp stays on for 16 minutes, but it may be switched off at any time by a second operation of this push button.