



WS No. 19 Mark III

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TEST TAPES FOR TAPE RECORDERS

Use of test tapes

1. Test tapes are frequently needed in order to check the frequency response of tape recorders or the alignment of the reproducing heads. These tapes are provided with certain recorders and form part of the complete equipment. Otherwise, standard types are available commercially and may be obtained through local purchase.

Their nature

2. A standard test tape is a recording of one or more pure audio tones (no harmonics) manufactured under closely controlled conditions to ensure precise frequencies and levels free from wow, flutter and undue noise. Vocal announcements may also be included concerning the frequency, level and duration of the tones. They are, of course, made to run at one particular tape speed but can often be used at a lower speed providing allowance is made for the resultant lower level and frequency. Where a range of frequencies is included for checking frequency response this is usually preceded by an initial tone near the middle of the range (ie at the frequency where recorder response is likely to be a maximum) and at a higher amplitude which is taken as the reference level. This is for adjusting the recorder gain to a suitable setting - normally the maximum level that can be listened to comfortably. A second and higher tone may then be included to enable the azimuth of the playback head to be adjusted until truly vertical, ie for peak output. The recorded level varies with frequency in a similar manner to the impedance of a parallel RC combination having a specified time constant and turnover frequency - the frequency at which reactance and resistance are equal. The recording characteristic is therefore defined in terms of the time constant of the equivalent RC combination. The CCIR standards are usually adhered to, viz:

|               |   |                           |
|---------------|---|---------------------------|
| For 15 in./s  | - | 35µs and 3.5kHz turnover  |
| For 7.5 in./s | - | 120µs and 1.6kHz turnover |

Care of tapes

3. All test tapes should be regarded as accurate standards of comparison and treated with due care in order to preserve their quality and accuracy. When not in use they should be kept in their metal container (if provided) and stored in a cool dry place free from stray magnetic fields (eg in a steel cabinet).

4. Gradual deterioration due to wear and exposure is inevitable, but this can be minimised if the following precautions are observed during use:

- a. At no time should any tape be placed in the vicinity of magnets, current carrying conductors or other electromagnetic devices (eg transformers, chokes, switching devices, electrical machines, loudspeakers, microphones, permanent-magnet meters, even magnetised screwdrivers or other tools). Any stray magnetism may distort or remove an existing recording or superimpose an unwanted noise signal.
- b. Before loading a tape onto a recorder, all heads or metal tape guides and pulleys which come into contact with the tape must be free from dirt and demagnetised as described in para 5.
- c. AT NO TIME MUST ANY MACHINE BE SWITCHED TO RECORD WHILST A STANDARD TEST TAPE IS MOUNTED ON IT.
- d. On no account must the tape be spooled at excessive speeds or used on an equipment which has not been checked for correct mechanical alignment.
- e. To avoid stretching or distortion the recommended tape tension must be adhered to throughout.
- f. Rewinding must be carried out with care to avoid creases, fold-overs or other unevenness which might damage the magnetic coating.
- g. On completion of tests return the test tape as soon as possible to storage as in para 3.
- h. Do not leave the tape unused for long periods otherwise adjacent layers may stick together or heavily recorded signals may print through onto an adjacent layer.

#### Demagnetisation of recorder

5. Demagnetisation of ferrous metal items in the tape transport mechanism is achieved using a small electromagnet (or special demagnetiser if supplied with the equipment) suitably energised by a.c. This is placed adjacent (but not in contact) with each item in turn for a few seconds and then slowly withdrawn to a distance of at least 3 ft. Actual contact between the demagnetiser and the recording or reproducing heads must be avoided since these might be damaged by an excessive alternating field. Contact should be prevented by interposing non-magnetic material such as cardboard approximately 1/8 in. thick.

#### Manufacture of test tapes

6. The manufacture of test tapes of reasonable quality is a precision process involving careful preliminary preparation and subsequent testing. Accurate copying of tapes requires similar measures plus the use, ideally, of two identical good quality recorders, both in good order and capable of being synchronised. It is recommended that neither process be attempted in a workshop. A recording is of little use for measurement purposes unless its own characteristics can be established with a known degree of accuracy.

ELECTRICAL AND MECHANICAL  
ENGINEERING REGULATIONS

R E S T R I C T E D

TELECOMMUNICATIONS  
C 004

Further information

7. Units requiring further information on test tapes may apply, giving full and precise details of their requirements, to:

Officer Commanding  
Telecommunications Branch  
Technical Group REME  
c/o SRDE  
Christchurch  
Hants, BH23 4JB

EME/8c/3244/Tels

END