made.

15.3Lining-up the circuit

On receiving the advice from the sub-control station, the control station should test the circuit using ATME No. 2. The time at which the tests are performed should take into account the availability schedules of the ATME No. 2 responding equipments and the period of peak traffic at the distant terminal exchange (see Recommendation M.150, § 3). The ATME No. 2 should be programmed to perform the full range of transmission measurements and signalling tests.

If the transmission level in the receive direction at the control station is not within ± 1 dB of its nominal level, the level should be adjusted to within ± 0.3 dB of its nominal level, and the circuit should then be retested.

If the transmission level in the receive direction at the sub-control station distant end is not within ± 1 dB of its nominal level or if any of the other limits specified in the Recommendation are not met in either direction of transmission, then the procedures given in §§ 7 to 12 should be followed.

When the ATME No. 2 tests have been successfully completed, the control station informs the sub-control station of the results.

15.4Recording of results

The control station should record all results given by ATME No. 2 for both directions of transmission."

Include the following two new Tables 5/M.580 and 6/M.580 in the Recommendation and renumber existing Tables 5/M.580 to Table 7/M.580. Existing references should be amended.

15.5Other tests

When the line-up procedure, as described above, has been completed, a check should be made of the functioning of the compandors, where appropriate, in accordance with Recommendation M.590. This should be followed by a speaking test including a check of the satisfactory operation of echo suppressors and echo cancellers.

Table 5/M.580 are not, faulty digital equipment is likely.

* Note - If the number of QDUs is 4 and the analogue noise level is -55 dBm0p, this procedure will produce less accurate results. In this case, a -30 dBmO test tone will be appropriate to check the analogue section, when a circuit is not fitted with an echo-canceller or the echo canceller can be disabled."

Existing §§ 9 to 11 should be renumbered 10 to 12. The note under existing § 9 should be deleted.

In § 12.3 (old § 11.3):

- replace the word "suppressors" with "control devices";

-add the following:

"In addition, a check of the echo control device with the corresponding tester as specified in Recommendations O.22 and O.25 should be made if available."

Introduce the following new § 13:

"13.Echo canceller test capability

When echo cancellers are fitted to a circuit, tests by other administrations using test facilities specified in Recommendation O.22, can successfully be carried out only if the canceller stages and echo path delay characteristic are programmed into the test sequence. Therefore, the administration placing echo cancellers in their international switching centre should so apprise the other administration(s). This may be done by a specific communication, for example a telex message, or by including such information with the exchange of routine maintenance schedules (Recommendation M.605)."

Renumber the existing § 12 to § 14, Record of results.

Add the following new paragraph after § 14:

"15.Setting-up and lining-up an international circuit using ATME

15.1The following procedure should be followed when it has been agreed between the administrations concerned that ATME No. 2 can be used. Generally, it is suitable only when there are no intermediate circuit sub-control stations and for circuits which do not have particular measurement requirements (see § 9).

15.2Setting-up the circuit

The circuit control and sub-control stations in conjunction with their testing points should ensure that all associated signalling, switching and other terminal equipment has been connected, is free from faults and is operating satisfactorily. This should include the check of signalling level specified in § 10. The sub-control station should advise the control station that these checks have been

All existing sub-paragraphs in § 8 should be renumbered accordingly.

Insert a new § 9 as follows:

"9.Measurement of total distortion

9.1General

This measurement is required for composite (i.e. mixed analogue/digital) circuits only. The measurement of total distortion should be made for both directions of transmission.

The measuring equipment should be as specified in Recommendation 0.132. [6].

The measuring equipment should be applied at the circuit access points.
A test frequency of 1 020 Hz should be used.

It is assumed that the measurements and adjustments outlined in §§ 7.2.2 and 7.2.3 above have already been carried out.

9.2Measurement of total distortion using a test signal level of -10 dBm0

9.2.1The results of the total distortion measurement should be compared with the total distortion objectives shown in Table 5/M.580 according to the number of Quantizing Distortion Units (QDUs) in the circuit and the total length of the analogue circuit sections.

9.2.2If these objectives are exceeded by a circuit which has satisfied the noise objectives described in § 8, then a fault on a digital equipment causing excessive quantizing distortion should be suspected.

9.3Measurement of total distortion using a test signal level of -25 dBmo

9.3.1On circuits routed via a circuit multiplication system employing digital speech interpolation, this measurement may be regarded as a substitute for a measurement of circuit noise. The results of the measurement should be compared with the objectives shown in Table 6/M.580.

9.3.2If the measured total distortion is higher by 5 dB or more than the appropriate value from Table 6/M.580 or is higher than -37 dBm0p, whichever is the more stringent requirement, on a circuit which has satisfied the test in § 9.2 above, then a fault on an analogue circuit section causing excessive noise should be suspected.

9.3.3For maintenance purposes a measurement of total distortion using a -25 dBm0 signal level can be useful on all composite circuits. In conjunction with a measurement using a -10 dBm0 signal level it may be possible to identify whether a fault lies in an analogue or digital circuit section from end-to-end measurements using the same instrument.* If the circuit satisfies the objectives of Table 5/M.580 but exceeds the objectives of Table 6/M.580, a faulty analogue circuit section should be suspected. Conversely, if the objectives of Table 6/M.580 are satisfied but those of

5.Proposed additions and revisions to Recommendation M.580

SETTING UP AND LINING UP OF AN
INTERNATIONAL CIRCUIT FOR PUBLIC TELEPHONY

Add the following text as a new sub-paragraph to § 1 of M.580:

"As an alternative to the procedures given in §§ 7 to 14 which require testing personnel to be present at both ends of the circuit, § 15 gives a procedure involving the use of the CCITT Automatic Transmission Measuring and Signalling Testing Equipment (ATME) No. 2 (Recommendation O.22) (with type a responding equipment) which may be used subject to the agreement of the administrations involved."

To § 7 add a footnote to the heading of this paragraph consisting of the following:

"The procedure given in § 15 may be followed as an alternative to those given in §§ 7 to 14 if agreement has been reached with the distant administration to use ATME No. 2 for lining up, measurement of circuit noise and functional tests. It should be noted that this procedure does not include the tests in § 12. The administrations involved should consider scheduling such tests, if applicable, when cooperative effort can be arranged."

Replace the existing note to Table 4/M.580 by the following one:

"Note - At the present time the section of a circuit provided by a satellite employing FDM techniques with an earth station at its receiving end of INTELSAT Standard A (Figure of merit 40.7 dB/k) or Standard C (Figure of merit 39.0 dB/k) contributes approximately 10,000 pWOp (-50 dBmOp) of noise. The noise contributed by earth stations with revised figures of merit are for further study. Therefore, for the purpose of determining maintenance limits for noise measurements on international public telephony circuits, the length of this section may be considered to be equivalent to a terrestrial length of 2,500 km.

The section of a circuit provided by a satellite employing FDM techniques with an earth station at its receiving end of INTELSAT Standard B contributes approximately 80,000 pWOp (-41 dBmOp) of noise for FM companded circuits. The methods of determining total distortion and/or noise objectives for such a circuit are given in Recommendation M.590.

The contribution to noise of a circuit section provided by a satellite employing TDM techniques remains a subject for further study."

Paragraph 8

Insert new sub-paragraph 8.1:

"8.1Where a circuit is routed via a circuit multiplication system employing digital speech interpolation techniques it may not be possible to make a reliable noise test using the method described in this paragraph. In this case, a total distortion measurement should be made instead, as described in § 9.3."