



# Engineering NEWS

ALTEC LANSING

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TECHNICAL LETTER NO. 169

Specific, well defined specifications are published for all Altec products to provide a clear, usable picture of the electronic device. The following is a copy of Drawing 5746-2 which is the instruction used by Altec personnel in the recording of engineering data to be used for publication. It was originated in 1954 to assure uniformity in the method of writing specifications describing Altec products. Reference to this material will give a greater insight into the meaning of the figures appearing on the specification sheet.

## INSTRUCTIONS FOR DETAILING "TYPICAL SPECIFICATION" SHEETS

### TYPE

Use the words "Fixed gain" preceding designation where applicable.

Example: Fixed gain preamplifier.

### GAIN

Gain shall be stated as insertion gain, recognizing the impedance between which the amplifier is to work.

- a. When matched impedances are implied, as in the case generally of transformer terminated amplifiers, state gain in decibels without qualification.

Example: 65 dB.

- b. Where the input transformer is a "bridging" rather than a terminating transformer, state the impedance of the source assuming that the source is terminated in its characteristic impedance by some other apparatus. Use the word "bridging" in the specification. The word bridging shall not be used in the absence of an input isolating transformer.

Example: 40 dB, bridging a 600  $\Omega$  line.

- c. When the input impedance is a potentiometer or a grid return resistor, state gain in terms of a source impedance equal to the nominal impedance from which the

device will be operated. If the device is general purpose and the source impedance not readily generalized, assume a source impedance equal to the actual input impedance and state the value. (Measurement reference - Proceedings of I.R.E., July 1946, P. 500).

Example: 42 dB from a 10,000  $\Omega$  source.

- d. When the output cannot be terminated in its characteristic impedance (such as the cathode follower), qualify the impedance used for measurement. When designed to be terminated by a specific apparatus, use the input impedance of that device.

Example: 46 dB into a 20,000  $\Omega$  load.

### INPUT SENSITIVITY

Specification intended primarily for booster, line or power amplifiers having no input transformer. Delete where not applicable. In the following example, where a level other than maximum rating has particular significance, the word "rated" may be deleted and a power level stated instead.

Example: 1.2 Volts rms for rated output.

### POWER OUTPUT

State power in dB relative to .001 Watts for low level line impedance amplifiers. Specify power in Watts for high level amplifiers. State output level in Volts, with load specified for gain measurement, for potential (as opposed to power) devices.

- Example: (a) +20 dBm at less than 0.5% THD, 50 - 15,000 Hz.  
(b) 40 Watts at less than 2% THD, 40 - 15,000 Hz.  
(c) 30 Volts rms with 100,000  $\Omega$  load at less than 1% THD.

In the case of monitoring devices, the words "voice frequency range" may be inserted, where applicable, in place of a specific frequency band.

### FREQUENCY RESPONSE

Standard notation shall be " $\pm 1$  dB" for an indicated frequency range. The figure "1 dB" may be larger or smaller to best describe the apparatus, if required. The expression "within \_\_\_ dB" shall be avoided.

Example: (a)  $\pm 1$  dB, 15 - 30,000 Hz.

When the amplifier has other than a uniform frequency response for a specific use, describe the response in terms of the use.

- (b) Equalized for magnetic pickup.

## INPUT IMPEDANCE AND CONFIGURATION

Specify impedance only when the input is a resistor or potentiometer and the source impedance may be any value. When the input is a potentiometer, so state. Use the word "unbalanced", if necessary, to clearly define a grounded input.

- Example: (a) 1 megohm.  
(b) 100,000  $\Omega$  potentiometer.  
(c) 150  $\Omega$ , unbalanced.

When the input is transformer isolated, so specify and state whether terminated or unterminated.

- (d) Input transformer, balanced, unterminated.

## SOURCE IMPEDANCE

Use this notation in all cases where input transformers are employed.

- Example: (a) 30/36, 250/300, 500/600  $\Omega$ .

Where only two impedance ranges are provided, use the word "and" between.

- (b) 30/36 and 250/300.

Additional explanatory material may be added as required.

- (c) 125/150 and 500/600  $\Omega$ . Center tap available for 500/600  $\Omega$  connection.

## LOAD IMPEDANCE

When two load impedances are provided, use the word "and" between figures. When three or more connections are provided, use only commas between figures.

- Example: (a) 8 and 16  $\Omega$ .  
(b) 4, 8, 16, 62  $\Omega$ .

When the device is a "potential" rather than a "power" device, indicate minimum load into which it will operate.

- (c) 10,000  $\Omega$  minimum.

## LOAD VOLTAGE

When two load voltages are provided, use the word "and" between figures. When three or more voltages are provided, use only commas between figures.

- Example: (a) 25 and 36 Volts.  
(b) 18, 25, 36, 70 Volts.

## OUTPUT IMPEDANCE

Give this data when it is of importance to the operation of the following equipment as in the case of a transducer. State in terms of percentage of load impedance except in the case where the two are equal.

- Example: (a) Less than 20% of nominal load impedance.  
(b) Equal to nominal impedance.

Potential devices should be specified in terms of "Ohms nominal" and where the output is a cathode follower, it should be so stated.

- (c) Cathode follower, 1,000 Ohms nominal.

## DAMPING FACTOR

Since this quantity is merely a quotient of load impedance divided by output impedance, state only on equipment designed for non-professional use.

## NOISE LEVEL

State value relative to .001 Watt: in dB below rated output, or as equivalent input noise level. Any or all of the rating methods may be used as the occasion demands.

- Example: Output noise -80 dBm: 100 dB below rated output.  
Equivalent input noise -120 dBm.

## CONTROLS

Where possible, use the following phrases inserting the appropriate values.

- a. Potentiometer, continuously variable composition.
- b. Potentiometer, 20 steps, 2 dB per step, last step infinity, no detent.
- c. "Bridged T" attenuator, 10 steps, 2 dB per step, 20 dB total, with detent.
- d. Fixed gain adjustment. (If other than infinite, state range, i.e., 20 dB range).

Describe equalizer and other special controls as required.

## POWER SUPPLY

For connection to power mains, state voltage, frequency and Watts. When primary taps are provided, show as in (b).

Example: (a) 117 Volts, 60 c/s, 120 Watts.  
(b) 105/117/130 Volts, 60 c/s, 120 Watts.

(Line Watts are to be specified for the condition of 1/3 rated output power into the appropriate load.)

When more than one type of power source is usable, state requirements. In the case of batteries, give current drain for zero signal, 1/3 rated output and full output. State which side of battery will be connected to ground in the equipment, if applicable.

Example: 120/240 Volts, 50/60 c/s, 420 Watts.

or

28 Volts dc, .2A at zero signal, 8.0A at 70 Watts, 14.0A at 200 Watts.  
Battery positive is ground.

When the power supply consists of plate and filament voltages, specify plate current in "mA" and filament current in amps.

Example: 260 V dc at 10 mA, 6.3 V ac at 0.6 A.

## EXTERNAL POWER AVAILABLE

State as in the preceding section.

## TUBES

List as in the following:

Example: 1 - 12AY7, 2 - 12AU7, 1 - 6AX5 ...

In the case of semiconductor equipment, active devices will not be listed except on an "individual case" basis where there is reason for doing so.

## DIMENSIONS

State height, width and depth in that order.

Example: 7" H, 19" W, 7" D.

## WEIGHT

This figure is to be the unpacked weight.

## SPECIAL FEATURES

Use description as required.

## ACCESSORIES

List material supplied as loose parts, such as plugs, connectors, etc., or material generally required in addition to that supplied. If furnished, use the words "supplied with equipment" as in (a) below. If available only on order, use the words "must be ordered separately" as in (b) below.

- Example: (a) 3 input connectors, supplied with equipment.  
(b) Cover tray and mating receptacle must be ordered separately as 11301 assembly.

By J. J. Noble