SOUND TECHNOLOGY
MODEL 1200A
STEREO TEST PANEL

SERIAL NO. _____

Sound Technology
1400 Dell Avenue
Campbell, CA 95008
Tel: (408) 378-6540

Manual printed in U.S.A.

WARRANTY

All new Sound Technology products are warranted against defects in materials and workmanship for one year from the date of delivery. Any instrument or component that is found to be defective within the warranty period after examination by Sound Technology or an authorized representative thereof will be repaired or replaced without charge for labor or material. No other warranty is expressed or implied. We are not liable for consequential damages.

Before returning a product to Sound Technology for service, authorization must be obtained from the factory. For products not covered by the warranty, a purchase order should be forwarded to avoid unnecessary delay. Please include instrument model number and serial number with all requests for parts or service to facilitate the fastest possible response.

All products returned to the factory must be shipped prepaid. For products under warranty, Sound Technology will pay for shipment back to the customer.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

SECTION 1

OPERATION

1-1. SCOPE OF SECTION

1-2. This section contains information and instructions necessary for operation of the Sound Technology Model 1200A Stereo Test Panel. This section also provides information on power requirements and unit interconnections.

1-3. INTRODUCTION

1-4. The Model 1200A provides a convenient means of interconnecting several signal input sources and output loads to an amplifier or receiver under test or evaluation. Inputs and outputs can be easily switched, modified, filtered, and connected to various other Sound Technology instruments to facilitate such tests.

1-5. The 1200A specifically accomodates the following Sound Technology instruments: the 1000A Alignment Generator, the 1100A Signal Conditioner, and the 1700A/B Distortion Analyzer. The 1200A also accomodates a bench receiver, an oscilloscope, and resistive and external speaker loads.

1-6. INPUT POWER REQUIREMENTS

1-7. The 1200A may be operated from either a 90-130 or 180-260 volt, 50-60 Hz, single phase power source. A two position slide switch on the rear panel should be set to match the input power line voltage. CAUTION: Check setting of this switch before applying power to the 1200A. The 1200A requires a 1 A, 3AG/AGC fast-blow type fuse.

1-8. POWER CABLE

1-9. The IEC (International Electrotechnical Commission) recommends grounding of instrument panels and cabinets to protect operating and servicing personnel. The 1200A is equipped with a 3-conductor power cable assembly, which when plugged into an appropriate outlet, grounds the unit through the round offset pin.

1-10. CONTROLS AND INDICATORS

1-11. The 1200A Data Sheet inserted in the front of this manual illustrates and briefly describes the front panel controls. The following descriptions will provide additional information on the function and operation of the controls and the interconnections between the 1200A and related equipment and instruments.

NOTE: Labeled controls and connectors are shown in **BOLD FACE** type.

a. The **POWER ON** switch turns on power to the 1200A only. The adjacent indicator will light when power is on.

b. If either or both **HOT CHASSIS** indicators glow, this indicates that the unit under test has a chassis potential of 30 volts or more with respect to power line ground.

c. The following **TEST SIGNAL** controls determine which test signal is used, where it shall be applied, and condition it as required.

(1) **1700 DIRECT** connects the **1700B SIGNAL OUTPUT** directly to amplifier input switches **(PHONO, AUX/TAPE)** and the **CHANNEL** select switches. NOTE: The **PHONO** signal is attenuated 34 dB.

(2) **BUFFERED 1700** connects the 1700 signal to buffering amplifiers in the 1200A before applying the signal to the amplifier input and **CHANNEL** select switches.

(3) **BUFFERED BENCH RCVR** connects the rear panel **BENCH RCVR RCDR LEFT/RIGHT** signals to buffering amplifiers in the 1200A before applying the signal to the amplifier input and **CHANNEL** select switches.

(4) **BUFFERED BENCH RCVR LEVEL** modifies the **BENCH RCVR RCDR LEFT/RIGHT** signal amplitude from a 16 dB gain to 50 dB attenuation.

(5) The **BUFFERED MONO INV RIAA** switch provides a monophonic signal to the **AMPLIFIER INPUTS PHONO LEFT/RIGHT** connectors which is the RIAA *recording* characteristic curve. This signal is obtained from either the 1700 or **BENCH RCVR,** and connects to the **PHONO** connectors when the appropriate **PHONO** and **CHANNEL** switches are pressed.

(6) **BUFFERED RIGHT LEVEL** adjusts the amplitude of the right channel signal through a ±2 dB range (with respect to the left channel) from either the 1700 or the bench receiver.

(7) The **PHONO** and **AUX/TAPE** switches connect the signal from the **1700 DIRECT, BUFFERED 1700,** or **BUFFERED BENCH RCVR,** through the **CHANNEL** switches to **AMPLIFIER INPUTS: PHONO** or **AUX/TAPE.**

(8) The **CHANNEL** switch connects the signal source to the **AMPLIFIER INPUT PHONO** or **AUX/TAPE** connectors such that only the desired channel is driven. For example: If **CHANNEL LEFT** is selected, the left channel is driven, while the right channel input (to the amplifier) is grounded. In the **BOTH** position, both channels are driven; in the **OFF** position, both channels are grounded.

d. The **LOAD** switches: **4, 8,** or **16** (ohms), and the **SPKR** switch and **FUSES** should be selected as follows:

(1) **LOAD** switches: **4, 8, 16,** connect the selected resistive load directly to **AMPLIFIER OUTPUTS: SPEAKERS LEFT/RIGHT.**

(2) When the **LOAD 4, 8, 16** switches are selected, the bench speakers are connected to the bench receiver. When the **SPKR** switch is pressed, the amplifier under test is connected to the bench speakers through the **SPEAKER FUSES**. Fuse value should match bench speaker rating.

e. The following **MEASUREMENT** controls select the input signal to the 1700 Analyzer, permit insertion of specific filter characteristics, and allow measurement of either stereo channel separately by the 1700.

(1) **ANALYZER INPUT SELECT EXT** connects the 1700 Analyzer **INPUT** to the **EXT** BNC connector.

(2) **ANALYZER INPUT SELECT AMPLIFIER** connects the 1700 **INPUT** to the 1200A **AMPLIFIER INPUTS (PHONO** or **AUX/TAPE)** or **AMPLIFIER OUTPUTS (RCDR** or **SPEAKERS).**

(3) **ANALYZER INPUT SELECT CHANNEL** connects either the **LEFT** or **RIGHT** channel of the signal selected by the **ANALYZER INPUT SELECT AMPLIFIER** switches. NOTE: **CHANNEL LEFT/RIGHT** switches are inactive when the **EXT** switch is depressed.

(4) **FILTERS: OUT, A, B, C, HIGH PASS, LOW PASS,** and **BAND PASS,** select various specific frequency response filters that when selected are functionally in series with the 1700 **FILTERS.**

f. The **FM MODULATION** controls determine the modulation signals that are applied to the 1000A Generator **LEFT/RIGHT** inputs as follows:

(1) **1700 LEFT** or **RIGHT** applies a signal from the **1700 SIGNAL OUTPUT** to the **1000A LEFT** or **RIGHT INPUT** respectively.

(2) **1700 L-R** applies the 1700 signal to the **LEFT** input of the 1000A, and an inverted signal to the **RIGHT** input of the 1000A.

(3) **1700 L+R** applies the 1700 signal to both the **LEFT** and **RIGHT** inputs of the 1000A.

(4) **1100** applies the signals from the 1100 **AUDIO OUT LEFT** and **RIGHT,** to the **LEFT** and **RIGHT** inputs respectively, of the 1000A.

g. The **OSCILLOSCOPE** controls select the oscilloscope trigger source, select the signals to be applied to the scope inputs, and set up the test system for scope XY or 1000A **SWEEP** operation.

(1) **EXT TRIGGER** switches select the trigger source that is applied to the scope external trigger input. These sources are **1700 SYNC OUT, 1700 INPUT MON, 1000A 19 kHz,** or **1000A INT OSC.**

(2) **SWEEP OR XY** converts the test system signal in a manner appropriate for the oscilloscope being used to suit the XY mode or the 1000A **SWEEP** mode of operation. NOTE: there are two programming switches on the 1200A rear panel that *once set for a particular scope,* need not be reprogrammed. These switches are set as follows:

The **X PGM** switch selects the scope input that will be used as the X input for the XY mode.

The **Y PGM** switch selects the scope input that will be used as the Y input for the XY mode.

(3) **SWEEP DRIVE** adjusts the amplitude of the X input drive when in the 1000A **SWEEP** mode.

(4) **1000A SWEEP** connects the **1000A HORIZ** and **VERT** outputs to the X and Y inputs of the scope.

(5) **1700** connects the 1700 **INPUT MONITOR** and **DISTORTION MONITOR** to the scope A and B inputs respectively.

(6) **RCDR OUT** connects the 1200A **AMPLIFIER OUTPUT RCDR LEFT** and **RIGHT** signals to the scope A and B inputs respectively.

(7) **EXT PROBE** partially over-rides the operation of the **1000A SWEEP, 1700,** and **RCDR OUT** switches. Independent of the status of those switches, **EXT PROBE** connects the scope BNC connector on the 1200A front panel to the B or Y scope input.

1-12. TEST SET-UP

1-13. The 1200A has been designed to provide pushbutton convenience for controlling the interconnections between various test instruments, while at the same time preserving the lowest level measurement capabilities of these instruments. A very important contribution to such capability is proper cabling and proper ground connections between the 1200A and the various instruments. The methods to be used are as follows:

a. Power Connections

(1) Check that the line voltage change switch on the 1200A rear panel is set to match the nominal power line voltage.

(2) Make sure the 1200A power plug ground terminal is making a reliable connection to an earth ground. *Do not float the 1200A above earth ground!*

b. Ground Connections

(1) All test instrument chassis should be connected to the power line ground. The 3-wire power cords supplied with the 1000A, 1100A, 1200A, and 1700, all make this connection when plugged into a properly wired and grounded outlet.

(2) Connect the chassis of the bench receiver and the 1700 chassis ground terminal to the 1200A rear panel chassis ground terminal.

(3) Connect the oscilloscope common (low) terminal to the 1700 chassis (for proper operation with the 1700). NOTE: This connection is normally made through the co-ax shields connecting the 1200A to the scope and the 1700 **INPUT MON** connector.

c. Signal Connections

(1) All signal connections between the 1200A and the various test instruments, bench receiver, external resistive loads, and the bench speakers, are made to clearly labeled terminals and connectors on the rear panel of the 1200A. The 1200A front panel connectors accomodate the receiver under test or evaluation, test probes for the 1700, and an oscilloscope.

1-14. 1700 DISTORTION MEASUREMENT SYSTEM

1-15. The 1700 must be placed directly to either side or directly above the 1200A. Do not attempt to lengthen the **EXT FILTERS** or **ANALYZER INPUT** cables supplied with the 1200A. IMPORTANT: The 1700 must have either a serial prefix of 112 or higher, or incorporate 1200A Option 001 (1700A/B Interface Kit).

1-16. All 1700 connections to the 1200A are made at the rear panel of the 1200A as labeled. The **EXT FILTER** connections are made with a 3-conductor phone cable (supplied with the 1200A).

1-17. The **ANALYZER INPUT** connections are made with a shielded twisted-pair cable (supplied with the 1200A). Use the bare wire cable terminations on the rear panel of the 1200A and the banana plug cable termination on the front panel of the 1700. Connect the cable shield to the circuit common (▽) on both ends.

1-18. The **SIGNAL OUT, INPUT MON, SYNC OUT,** and **DIST MON** connections are made with co-ax cable having BNC connector terminations. NOTE: If such cables are not readily available to you, they can be supplied at a nominal cost by Sound Technology.

1-19. 1000A FM ALIGNMENT GENERATOR

1-20. The positioning of the 1000A relative to the 1200A is not critical. All connections between the 1200A and the 1000A are made with co-ax cables having BNC connectors. The RF connection from the 1000A is to be made *directly* to the receiver under test.

1-21. The **COMP** signal from the 1000A is not normally used, and does not connect to the 1200A. If it is desired to use this signal (for example, stereo receiver demodulator test and alignment), connection should be made directly from the 1000A to the receiver circuitry.

1-22. 1100A SIGNAL CONDITIONER

1-23. The positioning of the 1100A relative to the 1200A is not critical. The **AUDIO OUT LEFT** and **RIGHT** connections are made to the 1200A rear panel as labeled, using co-ax cable having BNC connectors.

1-24. A tape or phono signal source is connected to the front panel of the 1100A in the usual manner.

1-25. OSCILLOSCOPE

1-26. The oscilloscope should be located reasonably close to the 1200A so input cable capacitance will not become excessive and degrade response.

1-27. Connections between the 1200A and the scope are made using two to four co-ax cable assemblies properly terminated with connectors matching the instruments. The exact number of interconnecting cables depends upon the model of scope being used, with connections being made to the rear panel of the 1200A.

1-28. The programming for the scope XY display capability is made with the **Y PGM** and **X PGM** switches on the 1200A rear panel. NOTE: These switches need be set only *once* for a particular model of scope, and are set to correspond to the X and Y inputs for that particular scope. For example: If the X signal is to drive the EXT HORIZ input of the scope, set the **X PGM** switch to the **EXT HORIZ** position, and check that there is an interconnection between the **EXT HORIZ** connectors on the 1200A and the scope.

1-29. An external probe can be connected to the scope through the **OSCILLOSCOPE EXT PROBE** connector on the 1200A front panel. However, because of the additional loading of the probe by this connection, some 10:1 divider probes may suffer bandwidth reduction and an incorrect voltage division, unless this additional capacitance can be adjusted out (refer to probe manufacturer's instructions). NOTE: No degradation in performance will occur if a 1:1 direct probe or an RF detector type probe is used.

1-30. If the scope does not have co-ax type connectors, be sure that the scope common (low) terminal is connected to the 1700 chassis. (This connection is normally made by the co-ax shields interconnecting the 1200A to scope channel A, and the 1200A to 1700 **INPUT MON**).

1-31. RESISTIVE LOADS

1-32. A terminal strip on the 1200A rear panel is used to make connections to speaker and high current resistive load circuits. The selection of a speaker or resistive load is obtained by pressing the appropriate **LOAD** switch on the 1200A front panel.

1-33. Four high-power, 8 ohm resistors should be connected as shown on the 1200A rear panel. Use 18 gauge or heavier wire (zip-cord or equivalent is satisfactory) to keep wire resistance below 40 milliohms. Care should be taken to make low-resistance connections at both the 1200A terminals and the load resistors. 250 watt, non-inductive load resistors are recommended; if they are not readily available to you, they may be obtained from Sound Technology.

1-34. Special care should also be taken to insure that the connections to the resistive loads cannot short to each other or to any other wires or chassis. Because the loads may be called upon to dissipate several hundred watts, adequate ventilation should be obtained, to prevent heat from damaging the load resistors or nearby equipment.

1-35. SPEAKERS

1-36. Two high-quality, wide range speakers should be connected to the 1200A rear panel terminal strip. Use the terminals marked **TO SPEAKER** +/-. These terminals are connected to the **SPEAKER FUSES LEFT/RIGHT** on the 1200A front panel; choose a fuse rating recommended by the speaker manufacturer for the intended use.

1-37. BENCH RECEIVER

1-38. The positioning of the bench receiver relative to the 1200A is not critical. All connections between the bench receiver and the 1200A are made with shielded audio cable having RCA type phono connectors.

1-39. Connect bench receiver recorder outputs to the 1200A *rear panel* **BENCH RCVR RCDR LEFT/RIGHT** connectors, and the receiver auxiliary inputs to the 1200A **BENCH RCVR AUX LEFT/RIGHT** connectors.

1-40. Connect the bench receiver left and right speaker outputs to the corresponding terminal strip connections on the 1200A rear panel labeled **FROM BENCR RCVR** +/-. Use 18 gauge zip-cord or equivalent.

1-41. AMPLIFIER OR RECEIVER UNDER TEST

WARNING

FOR YOUR SAFETY, THE CHASSIS OF THE RECEIVER OR AMPLIFIER UNDER TEST SHOULD ALWAYS BE CONNECTED TO THE 1200A CHASSIS (⏚) BEFORE CONNECTING THE RECEIVER/AMPLIFIER TO A POWER SOURCE. THIS CHASSIS CONNECTION SHOULD BE MAINTAINED AT ALL TIMES.

CAUTION

CONNECTING A RECEIVER OR AMPLIFIER WITH A "HOT CHASSIS" TO ANY OF THE 1200A FRONT PANEL CONNECTORS MAY BLOW FUSES F1 OR F2 ON THE LOWER LEFT FRONT PANEL OF THE 1200A AND/OR F1 OR F2 IN THE 1700. A HOT CHASSIS IS INDICATED BY THE LIGHTING OF ONE OR BOTH LAMPS UNDER THE **CAUTION - HOT CHASSIS** LEGEND ON THE 1200A. IF EITHER OR BOTH OF THESE LAMPS ARE LIT, CAREFULLY DISCONNECT THE UNIT UNDER TEST FROM THE POWER LINE, REPAIR THE FAULT, CHECK AND REPLACE AS NECESSARY FUSES F1 AND F2 ON THE 1200A AND THE 1700.

1-42. All connections between the 1200A and the unit under test are made to the 1200A front panel connectors. Connect the **TO AMPLIFIER INPUTS: PHONO** and/or **AUX/-TAPE** to the corresponding connectors on the unit to be tested. Use shielded audio cable having connectors that match those of the 1200A and the unit under test. Connect the **FROM AMPLIFIER OUTPUTS: SPEAKERS LEFT/RIGHT** to the corresponding speaker terminals on the unit under test, using 18 gauge or heavier wire. If the unit has a recorder output, connect it through shielded audio cable to the **AMPLIFIER OUTPUT: RCDR LEFT/RIGHT** connectors.

1-43. AMPLIFIER TESTS

NOTE: The plotting of frequency response, distortion, power output curves, etc. on graph paper, will result in the best evaluation of the quality of performance of an amplifier under test. This procedure is especially effective for evaluation of stereo units, and is strongly recommended. Four-cycle semi-log graph paper is most useful for wide-range testing.

a. BASIC SET-UP 1

CAUTION: Reduce all signal levels to minimum before connecting equipment.

Set 1200A controls as follows:

OSCILLOSCOPE:	1700 INPUT MON, 1700 A-INPUT/B-DIST
MEASUREMENT:	AMPLIFIER OUTPUT: SPKRS, CHANNEL: LEFT, FILTERS: OUT
TEST SIGNAL:	BUFFERED 1700, AUX/TAPE, CHANNEL: BOTH
LOAD:	8 (ohms)

Set 1700 controls as follows (see 1700 Manual):

FREQUENCY:	1000 Hz
FILTERS:	80 kHz
FUNCTION:	VOLTS/POWER
INPUT:	To desired power range
ADJUST:	AUTO SET LEVEL position
OSC LEVEL:	Minimum
OSCILLATOR:	LOW DISTORTION

Set controls of amplifier under test as follows:

BASS/TREBLE:	FLAT
LOUDNESS:	OFF
INPUT:	AUX
BALANCE:	Approximately centered
SPEAKERS:	ON
VOLUME:	Maximum

b. Total Harmonic Distortion vs. Frequency at Rated Power

(1) Set controls as stated in Set-Up 1.

(2) Adjust 1700 **OSCILLATOR LEVEL** until amplifier rated output power (read on 1700 meter) is reached.

(3) Adjust oscilloscope controls for convenient display of amplifier output signal and distortion. NOTE: If amplifier output power rating is unknown, increase 1700 **OSCILLATOR LEVEL** until "clipping" or other signs of amplifier overload become evident. Reduce **OSCILLATOR LEVEL** slightly until signs of overload disappear.

(4) Reset 1200A **MEASUREMENT** to **RIGHT CHANNEL**.

(5) Adjust **TEST SIGNAL RIGHT LEVEL** control until right channel amplifier output matches the left output. Recheck scope display for signs of overload from either channel, *and reduce oscillator level if necessary*. The measured output power may be used as the rated power output of the amplifier.

(6) Reset 1700 **FUNCTION** switch to **DISTORTION**. Read the amplifier's right channel distortion on the meter of the 1700.

(7) Set 1200A **MEASUREMENT** to **LEFT CHANNEL**. Read amplifier's left channel distortion.

(8) Repeat above measurements at other frequencies, and plot a curve showing amplifier distortion vs. frequency at rated power. NOTE: The test may also be run with a 4 or 16 ohm load by pressing the appropriate button on the 1200A front panel.

c. Total Harmonic Distortion vs. Power at 1 kHz.

(1) Set controls as stated in Set-Up 1.

(2) Set 1700 to **1 kHz**, and drive amplifier to rated power output from both channels as described in paragraph 1-43b above.

(3) Record (plot) distortion of both channels.

(4) Reduce amplifier output power in 3 dB (1/2 power) increments, recording left and right channel distortion at each step. NOTE: The minimum output power level at which distortion need be recorded is 250 mW. Also, if desired, the amplifier may be driven slightly above rated power to record the increase in distortion as overload occurs.

d. Intermodulation Distortion vs. Power (For 1700 units with Option 004)

(1) Set controls as stated in Set-Up 1.

(2) Set 1700 to **PK EQUIV V/PWR.**

(3) Drive amplifier to rated power output from both channels. NOTE: Refer to 1700 Instruction Manual for determination of IM output power as compared to a single frequency power level.

(4) Set 1700 to **IMD** and record left and right channel distortion at amplifier's rated power output. Reduce power in 3 dB (1/2 power) increments, recording distortion at each step. NOTE: The minimum power level at which distortion need be measured is 250 mW. If desired, the amplifier may be driven slightly above rated power to record the increase in distortion as overload occurs.

(5) The test may be repeated with other loads.

e. Signal-to-Noise Ratio Refered to Rated Power — **AUX** Input

(1) Set controls as stated in Set-Up 1.

(2) Drive amplifier to rated power as described in paragraph 1-43c.

(3) Reset 1700 controls as follows:

FUNCTION:	**dB VOLTS**
RATIO:	**0 dB**
ADJUST:	Set for full scale meter reading

(4) Reset 1200A controls as follows:

MEASUREMENT:	**CHANNEL: RIGHT, FILTERS: A (B, C, OUT,** may be used as desired)
TEST SIGNAL:	**CHANNEL: OFF**

(5) Range 1700 **RATIO** switch down until on-scale reading is obtained. Read right channel signal-to-noise ratio directly in dB.

(6) Reset 1200A **MEASUREMENT** to **LEFT CHANNEL**. Read left channel signal-to-noise ratio.

f. Signal-to-Noise Ratio Referred to Rated Power — **PHONO** Input

(1) Reset 1200A **TEST SIGNAL** to **PHONO** and repeat above test.

g. RIAA Phono Equalization Response Accuracy

(1) Set controls as stated in Set-Up 1.

(2) Reset 1200A controls as follows:

MEASUREMENT:	**AMPLIFIER OUTPUT: RCDR**
TEST SIGNAL:	**BUFFERED 1700, MONO INV RIAA, PHONO**

(3) Reset 1700 controls as follows:

INPUT:	**0.3 V** range
OSCILLATOR:	**FAST RESPONSE**

(4) Reset amplifier to **PHONO** input, and drive that input to a reading of approximately 0.15 volts on the 1700 meter.

(5) Reset 1700 controls as follows:

FUNCTION:	**dB VOLTS**
RATIO:	**0 dB** range
ADJUST:	Set for -3 dB meter reading

(6) Program 1700 **FREQUENCY** switches over the RIAA phono equalization range noting any change in reading at each frequency. Changes in meter readings are *errors* in phono preamp equalization. Record (plot) meter deviations.

(7) Repeat test for left channel.

h. Amplifier Tone Control Response

NOTE: Treble cut response will be described as an example of all bass and treble boost or cut responses.

(1) Set controls as stated in Set-Up 1.

(2) Reset these 1700 controls as follows:

INPUT:	Proper range to measure 1/10 rated power output of amplifier
OSCILLATOR:	**FAST RESPONSE**
FREQUENCY:	**500 Hz**

(3) Set amplifier treble control for maximum cut. Drive amplifier to 1/10 rated power output.

(4) Reset 1700 controls as follows:

FUNCTION:	dB VOLTS
RATIO:	0 dB range
ADJUST:	Set for 0 dB meter reading

(5) Increase 1700 **FREQUENCY** in a 1, 2, 5 sequence (for example), plotting meter readings as a function of level and frequency. As readings go off scale, reset **INPUT** switch to next lower range and subtract 10 dB from reading (refer to 1700 Manual).

(6) Repeat measurements for left channel.

1-45. RECEIVER TESTS

a. BASIC SET-UP 2

CAUTION: Set receiver volume at minimum before switching to FM band.

Set receiver controls as follows:

FUNCTION:	FM STEREO
MUTING:	OFF
LOUDNESS:	OFF
BASS/TREBLE:	FLAT
SPEAKERS:	ON
AFC:	OFF
SENSITIVITY:	DISTANT
FILTERS:	OUT
TUNING:	Dead spot in FM band

Set 1200A controls as follows:

OSCILLOSCOPE:	1700 INPUT MON, 1700 A-INPUT/B-DIST
MEASUREMENT:	AMPLIFIER OUTPUT: SPKRS, CHANNEL: LEFT, FILTERS: BAND PASS
FM MOD:	1700 L-R
LOAD:	8 (ohms)

Set 1000A controls as follows:

RF LEVEL:	65 dBf (970 microvolts with S-T Model 100 Transformer)
FUNCTION:	STEREO
PILOT LEVEL:	9% (see 1000A Manual)
INPUT:	EXT
FREQUENCY:	Tune to receiver setting

Set 1700 controls as follows:

FUNCTION:	VOLTS/POWER
INPUT:	Proper range to drive amplifier to 1/10 rated power
FREQUENCY:	1000 Hz
FILTERS:	80 kHz
OSC LEVEL:	Set for 100% modulation as read on 1000A meter
ADJUST:	AUTO SET LEVEL position
OSCILLATOR:	LOW DISTORTION

Set receiver VOLUME for 1/10 rated power output.

b. Total Harmonic Distortion at 65 dBf

(1) Set controls as stated in Set-Up 2.

(2) Measure THD using 1700.

(3) Set 1200A to **RIGHT CHANNEL** and repeat test.

NOTE: IEEE/IHF test requirements specify repeating test at 100 Hz and 6 kHz.

c. Sensitivity for 30 dB Quieting

(1) Set controls as stated in Set-Up 2.

(2) Reset 1700 controls as follows:

FUNCTION:	DISTORTION
RATIO:	3% (-30 dB) range

(3) Reduce 1000A **RF LEVEL** until distortion reading rises to 30 dB. Sensitivity for 30 dB (3%) quieting is the **RF LEVEL** dial reading in microvolts or dBf. NOTE: This test is very sensitive to receiver tuning. Receiver may be more sensitive in MONO.

d. Signal-to-Noise Ratio

(1) Set controls as stated in Set-Up 2.

(2) Reset 1000A to **MONO.**

(3) Set receiver to MONO.

(4) Reset 1200A controls as follows:

FM MOD:	**LEFT**
FILTERS:	**LOW PASS**

(5) Reset 1700 controls as follows:

FUNCTION:	**dB VOLTS**
RATIO:	**0 dB** range
ADJUST:	Set for full scale meter reading

(6) Reset 1000A to **CW.**

(7) Range 1700 **RATIO** switch down to obtain an on-scale meter reading.

(8) Read signal-to-noise ratio directly in dB on 1700 meter.

e. Hum and Noise at 65 dBf

(1) Set controls as stated in Set-Up 2.

(2) Reset 1000A to **MONO.**

(3) Reset receiver to MONO.

(4) Reset 1200A controls as follows:

FM MOD:	**LEFT**
FILTERS:	**LOW PASS**

(5) Reset 1700 controls as follows:

FUNCTION:	**dB VOLTS**
RATIO:	**0 dB** range
ADJUST:	Set for full scale meter reading

(6) Reset 1000A to **CW.**

(7) Range 1700 **RATIO** switch down to obtain an on-scale meter reading.

(8) Read hum and noise at 65 dBf directly in dB on 1700 meter.

f. Sensitivity for 50 dB Quieting

(1) Set controls as stated in Set-Up 2.

(2) Reset 1000A to **MONO.**

(3) Reset receiver to MONO.

(4) Reset 1200A **FM MODULATION** to **LEFT.**

(5) Reset 1700 controls as follows:

FUNCTION:	**dB VOLTS**
RATIO:	**0 dB** range
ADJUST:	Set for full scale meter reading

(6) Reset 1000A to **CW.**

(7) Reset 1700 **RATIO** switch to **-50 dB** range.

(8) Reduce 1000A **RF LEVEL** until noise reading rises to -50 dB. Sensitivity for 50 dB quieting is the **RF LEVEL** dial reading in microvolts or dBf.

g. Separation at 65 dBf

(1) Set controls as stated in Set-Up 2.

(2) Reset 1200A **FM MODULATION** to **LEFT.**

(3) Reset 1700 controls as follows:

FUNCTION:	**dB VOLTS**
RATIO:	**0 dB** range
ADJUST:	Set for 0 dB meter reading

(4) Reset 1200A **MEASUREMENT** to **RIGHT CHANNEL.**

(5) Range 1700 **RATIO** switch down to obtain an on-scale reading on 1700 meter. Read left separation directly in dB.

(6) Reset 1200A **FM MODULATION** to **RIGHT CHANNEL.**

(7) Reset 1700 **RATIO** switch to **0 dB** range. Set **ADJUST** control for 0 dB meter reading.

(8) Reset 1200A **MEASUREMENT** to **LEFT CHANNEL.**

(9) Range 1700 **RATIO** switch down to obtain an on-scale reading on 1700 meter. Read right separation directly in dB.

h. Subcarrier Rejection

(1) Set controls as stated in Set-Up 2.

(2) Reset 1200A **FILTERS** to **HIGH PASS.**

(3) Reset 1700 controls as follows:

FUNCTION:	**dB VOLTS**
RATIO:	**0 dB range**
ADJUST:	Set for full scale meter reading

(4) Press 1700 **SIGNAL OFF** button. Range **RATIO** switch down to obtain an on-scale reading on 1700 meter. Read subcarrier rejection directly in dB.

SECTION 2

THEORY OF OPERATION

2-1. INTRODUCTION

2-2. The Model 1200A Stereo Test Panel provides three basic functions:

a. Convenient switching to eliminate cumbersome and repetitious cabling requirements.

b. Test signal conditioning to simplify dual-channel measurements, including a precise inverse-RIAA function to allow accurate and convenient measurements of phono preamplifiers.

c. Measurement pass-band filtering, in accordance with ANSI and IEEE-IHF specifications.

2-3. Other significant features include test speaker protection, hot chassis protection, external probe connectors for both an oscilloscope and a Sound Technology Model 1700A/B Distortion Analyzer, sweep width control for S-T Model 1000A Dual-Sweep operation, and precise FM modulation signals.

2-4. GENERAL DESCRIPTION

2-5. The 1200A can be considered to include eight separate functional blocks as shown in Figure 2-1: 1200A Functional Block Diagram.

a. The TEST SIGNAL CONTROL function selects either the bench receiver or the 1700 as a signal source, and applies the signal to the **PHONO** or **AUX/TAPE LEFT** or **RIGHT** channels. The signals can be amplified, attenuated, or passed through a precision inverse-RIAA filter.

b. The LOAD SWITCHING function selects a 4, 8, or 16 ohm external resistive load.

c. SPEAKER SWITCHING connects the test speaker to either the bench receiver or the amplifier under test. The test speakers are always connected to the bench receiver unless the **LOAD SPKR** button on the 1200A front panel is pressed, at which time the test speakers are connected to the unit under test.

d. The MEASUREMENT SWITCHING function connects various signals (as shown in the Block Diagram) to the 1700 Analyzer input.

e. MEASUREMENT FILTERS connects various low-pass, high-pass, or band-pass filters into the 1700 circuitry, effectively in series with the 1700 filters.

f. The FM MODULATION function selects the 1700 oscillator or the 1100A Signal Conditioner as a signal source, and applies the signal to either or both channels of the 1000A. An inversion function is also provided, so a Left Minus Right (L-R) signal can be applied to the 1000A.

g. OSCILLOSCOPE SYNC SWITCHING selects various sync signal sources from the 1700 or the 1000A, and applies the sync signal to the scope. An XY display mode may also be selected by this switch function.

h. The OSCILLOSCOPE DISPLAY SWITCHING selects various signals from the 1000A, 1700, or the unit under test, for display on a dual-channel oscilloscope.

2-6. DETAILED CIRCUIT DESCRIPTION

2-7. 1200A circuitry including the signal buffers, ANSI, IEEE-IHF, and inverse-RIAA filters, and the hot chassis protection circuits, are described as they appear on the various PC boards in the 1200A.

a. Signal Buffers - these circuits are located on the Test Signal PC board (A3) - see Figure 4-4.

U304 and U305 are the left and right channel buffers respectively, for the bench receiver when it is used as the signal source. These buffers, in conjunction with the **BENCH RCVR LEVEL** potentiometer R2, provide gain varying from approximately -50 to +16 dB.

U303 and U306 are the left and right channel buffers respectively, for the 1700 when it is used as the signal source. When using the bench receiver as the source, the signals from U304 and U305 are also passed through U303 and U306 respectively. U303 has unity gain, while the gain of U306 can be varied approximately ±2 dB by the **RIGHT LEVEL** controls (R3). The outputs of U303 and U306 are connected to the **AUX/TAPE LEFT/RIGHT** connectors via the **AUX/TAPE** and **CHANNEL** switches. The outputs are also connected to a 34 dB divider (R310/-311, R314/315) which feeds the **PHONO LEFT/RIGHT** connectors via the **PHONO** and **CHANNEL** switches.

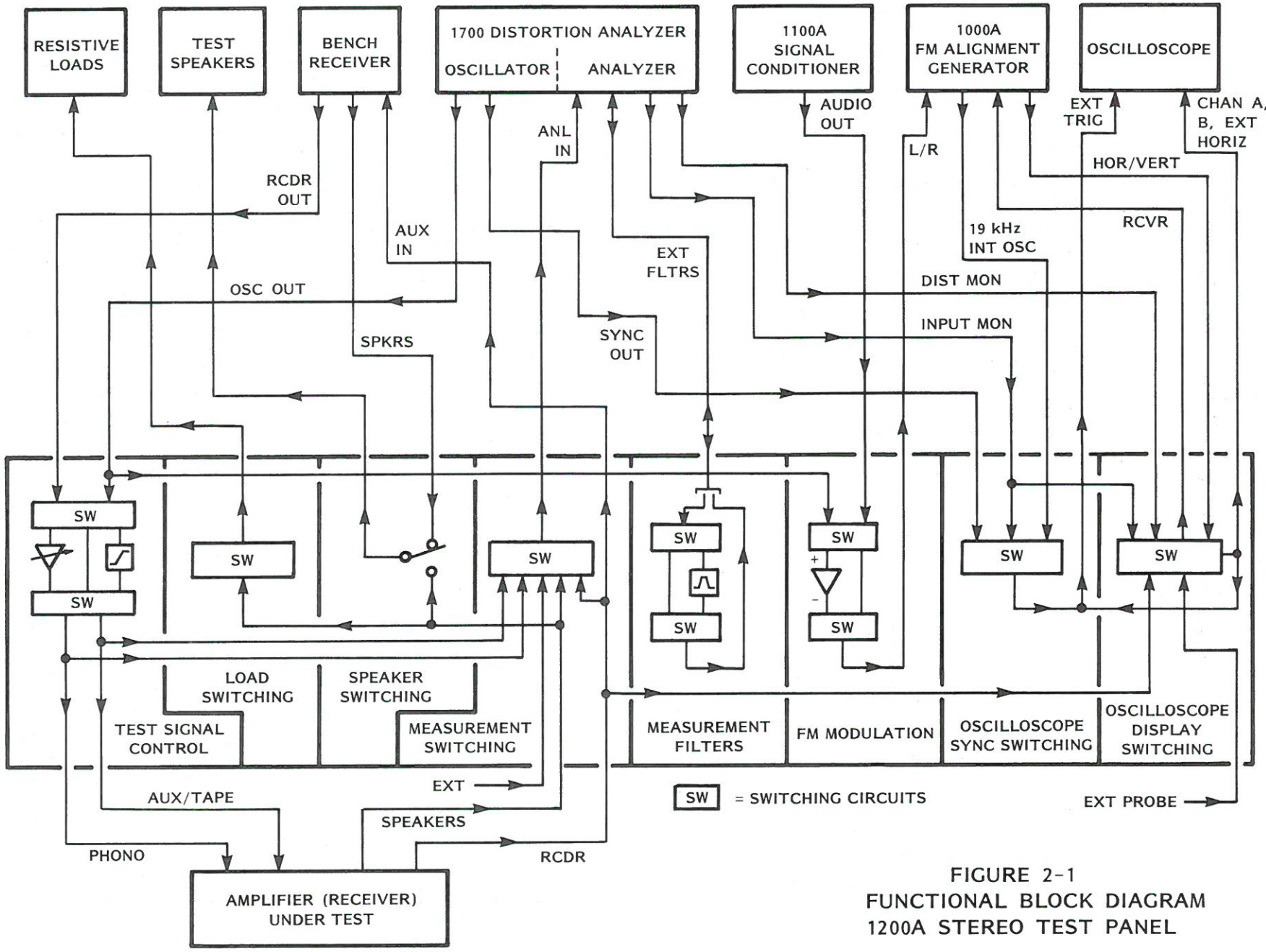

FIGURE 2-1
FUNCTIONAL BLOCK DIAGRAM
1200A STEREO TEST PANEL

b. Inverse-RIAA Filter - located on the Test Signal PC board (A3) - see Figure 4-4.

When the inverse-RIAA function is selected, the signal to the **PHONO LEFT/RIGHT** connectors is supplied by the output of U302. The filter portion consists of U303, U302, and associated components.

U303 acts as a low-impedance source for the filter, and mixes the left and right channel signals from the bench receiver (when it is used as the signal source). The frequency response of the U302/303 circuitry is shown in Figure 2-2. The output impedance is 75 ohms. (U301 is used for factory test purposes only, and is removed from the circuit after testing.

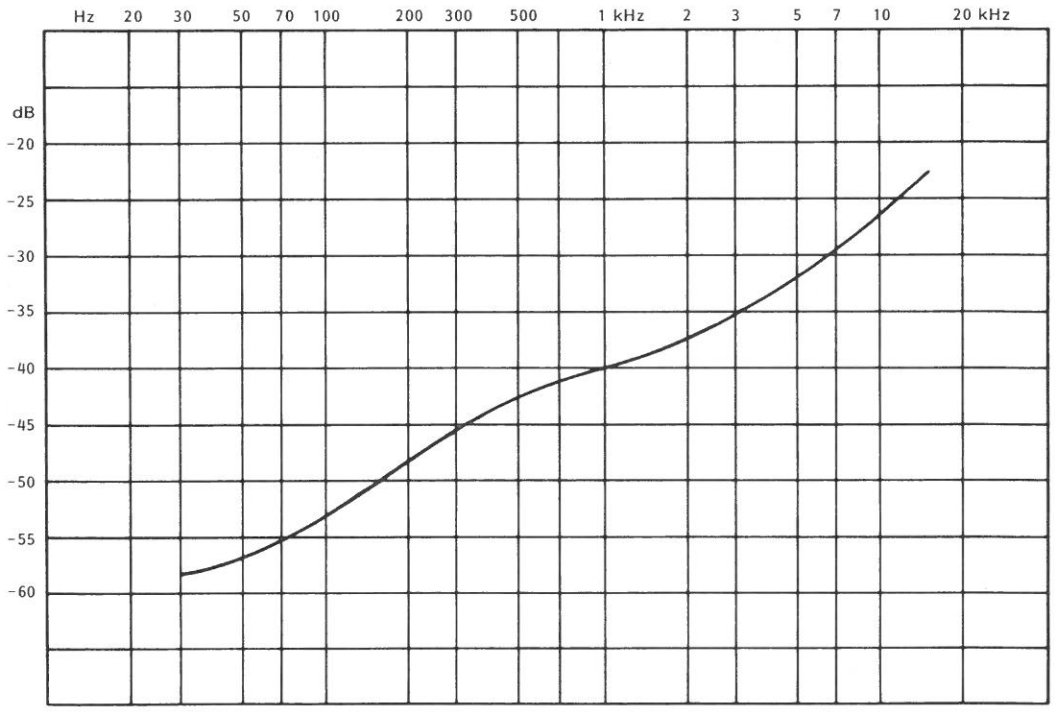

FIGURE 2-2. INVERSE RIAA FILTER RESPONSE

c. ANSI A, B, and C Filters - located on the Test Signal PC board (A3) - see Figure 4-4.

The characteristics of the A, B, and C filters are specified in IHF Standard IHF-A-201 (see Note 1), for noise weighting when making signal-to-noise ratio measurements. The B filter is also specified in EIA Standard RS-234-C (see Note 2). The filter characteristics are specified by ANSI S1.4-1971 (R1976) (see Note 3), as part of a specification relating to sound level meters. Frequency response of the filters is shown in Figure 2-3.

The basic configuration is the C filter with 3 dB points at 31.5 Hz and 8 kHz, with both roll-offs at 12 dB/octave. Low-end roll-off occurs in the input stage (U208), with high-end roll-off in the output stage (U210).

In the B filter, an additional low-end roll-off is provided by the insertion of a single RC stage ahead of buffer amplifier U209. The A filter low-end roll-off is accomplished by inserting a double RC ladder network ahead of U209. Attenuation at 31.5 Hz is 17.1 dB for the B filter, and 39.4 dB for the A filter. Overall gain at 1 kHz is unity for all three filters, with no adjustment required for the C filter. The A filter 1 kHz gain is adjusted with R241, and the B filter 1 kHz gain with R240 (A and B filter gain controls are interactive).

NOTE 1: *Institute of High Fidelity, Inc.*
516 Fifth Avenue
New York City, NY 10036

NOTE 2: *Electronic Industries Association*
2001 Eye Street, N.W.
Washington, DC 20006

NOTE 3: *American National Standards Institute, Inc.*
1430 Broadway
New York City, NY 10018

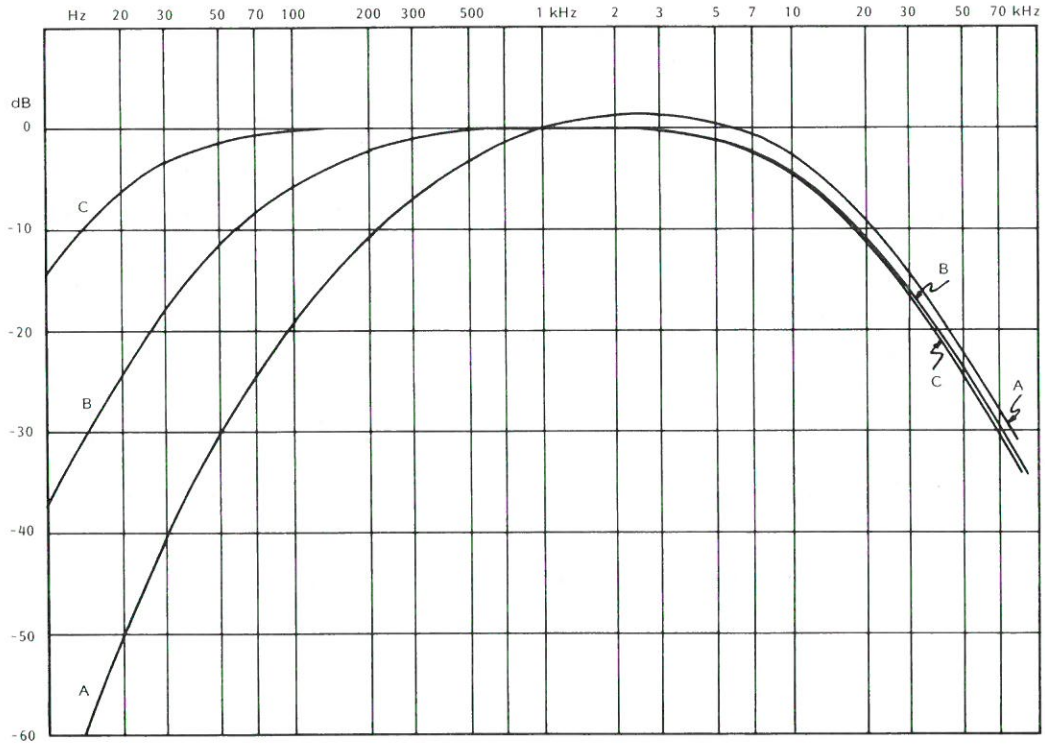

FIGURE 2-3. ANSI NOISE WEIGHTING FILTER RESPONSE

d. IEEE/IHF Receiver Filters - located on Test Signal PC board (A3) - see Figure 4-4.

These filters are specified for receiver measurement in IEEE Standard 185-1975/ IHF-T-200, 1975 (see Note 4). The filters consist of three basic configurations: a high-pass filter, a low-pass filter, and a band-pass filter.

The high-pass filter, with the 3 dB point at 200 Hz, is used to determine that component of the signal which is due to power line or power supply interference. The low-pass filter, with its 3 dB point at 15 kHz and a very steep roll-off above that, is used to determine the effect of frequency interference above 15 kHz, such as stereo pilot tone and 38 kHz decoder switching frequencies. The band-pass filter consists of a series connection of the high and low-pass filters. Frequency response curves for the three filters are shown in Figure 2-4.

The high-pass filter consists of U201, U202, and U203, and is a 6-pole Butterworth type providing a maximally flat response in the pass-band. The 3 dB breakpoint is set at 200 Hz. At this frequency, the gain of U201 is 5.76 dB, U202 gain is -3 dB, and U203 is -5.76 dB.

The low-pass filter consists of three stages (U204-U206) having a sharp cut-off above 15 kHz, followed by a low-Q 19 kHz notch filter (U207). Overall gain is set to unity by R214.

Input to the low-pass filter is U204 pin 2 with the output at pin 6. Stage output rises with frequency and peaks at 15.75 kHz (set by C203); gain then falls off rapidly. At 15 kHz, the gain is approximately 4.5 (13 dB), Thus a 1 volt signal input would result in a 4.5 volt output at pin 6.

The second stage (U205) also has an output rising with frequency, but with a peak between 10 - 11 kHz. Stage gain at the peak is about 1.45 (3.2 dB), but at 15 kHz is approximately unity.

The third stage (U206) has a response which continuously falls with frequency. 15 kHz gain is about 1/4.5 (-13 dB).

Overall effect of the three stages is a very flat response to 15 kHz, after which response falls off rapidly.

The notch filter is set to 19 kHz with R219, and it is this section which provides the 3 dB cut off point at 15 kHz.

NOTE 4: Institute of Electrical Engineers, Inc.
345 East 47th Street
New York City, NY 10017

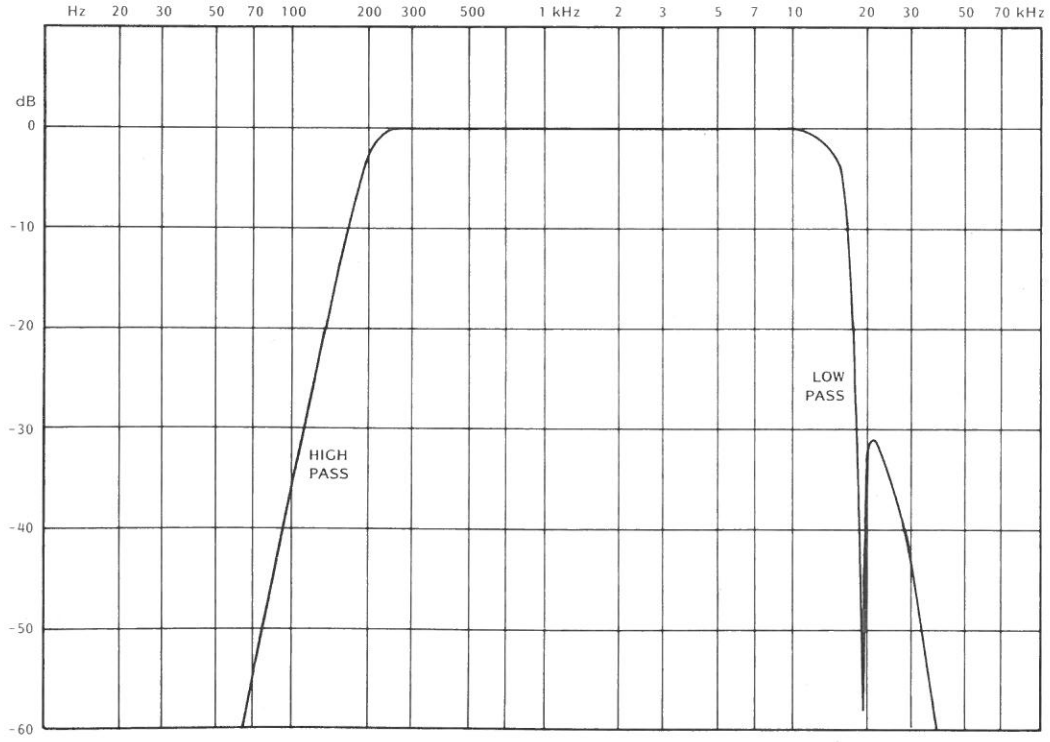

FIGURE 2-4. IEEE/IHF RECEIVER FILTER RESPONSE

SECTION 4

COMPONENT LOCATORS CIRCUIT SCHEMATICS

4-1. GENERAL

4-2. Schematics and Component Locators are arranged by Assembly number (A1, A2, etc.). All assembly related drawings and diagrams have the same figure number, but have different suffix letters (4-3A, 4-3B, etc.).

4-3. Parts Lists and ordering information will be found in Section 5.

4-4. Unless otherwise specified, the following notes apply to all figures in this section:

a. Resistance values in ohms.

b. Capacitance values in microfarads ("pf" values in picofarads).

c. Connector reference numbers may not appear on part.

d. SAT = Selected at Test, nominal value shown, part may not be installed. MP = Matched Pair.