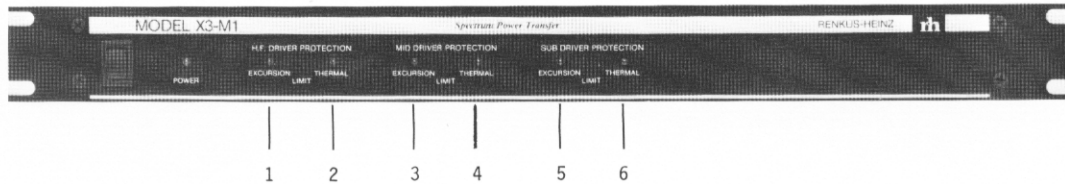


X3-M1 OPERATION MANUAL

FRONT PANEL INDICATORS

MODEL X3-M1 (SINGLE CHANNEL THREE-WAY)



DRIVER PROTECTION INDICATORS

- | | |
|---|---|
| (1) High Frequency Driver "Excursion Limit" LED | indicates activation of the H.F. spectrum transfer protection circuits, which control the energy spectrum distribution between the H.F. and the Mid Driver. |
| (2) High Frequency Driver "Thermal Limit" LED | indicates that the H.F. thermal protection circuits are reducing the level of the H.F. energy to the H.F. Driver. |
| (3) Mid Frequency Driver "Excursion Limit" LED | indicates activation of the Mid spectrum transfer protection circuits, which control the energy spectrum distribution between the Mid and the Sub Driver. |
| (4) Mid Frequency Driver "Thermal Limit" LED | indicates that the Mid thermal protection circuits are reducing the level of the Mid energy to the Mid Driver. |
| (5) Sub Driver "Excursion Limit" LED | indicates control of the very low end of the spectrum to the Sub Driver. |
| (6) Sub Driver "Thermal Limit" LED | indicates reduction of energy to the Sub Driver. |

REAR PANEL CONNECTORS AND SWITCHES

MODEL X3-M1

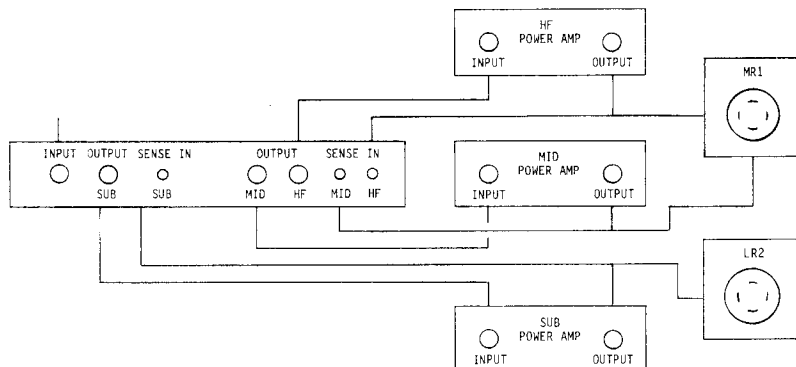


- (1) INPUT
Balanced female XLR connector.
- (2) LOUDNESS COMPENSATION SWITCH
The IN/OUT switch for a level sensitive low frequency contour that automatically compensates for human hearing response at low Sound Pressure levels. Except for purposes of room equalization, this switch should be "ON".
- (3) SUB DRIVER OUTPUT
Balanced male XLR connector provides signal to the input of the subwoofer amplifier(s). Output is electronically balanced.
- (4) SUB DRIVER SENSE INPUT
A 1/4" phone jack connects the output of the subwoofer amplifier to the subwoofer protection circuits.
- (5) MID DRIVER OUTPUT
Balanced male XLR connector provides signal to the input of the mid frequency amplifier(s). Pin configuration as in (3) above.
- (6) HIGH FREQUENCY OUTPUT (H.F.)
Balanced male XLR connector provides signal to the input of the high frequency amplifier(s). Pin configuration as in (3) above.
- (7) MID FREQUENCY SENSE INPUT
A 1/4" phone jack connects the output of the mid frequency amplifier to the mid frequency protection circuits.
- (8) HIGH FREQUENCY SENSE INPUT (H.F.)
A 1/4" phone jack connects the output of the high frequency amplifier to the high frequency protection circuits.
- (9) CHASSIS GROUND SELECTOR
This switch disconnects (floats) the chassis from the circuit ground. The switch should be set for minimum hum, after all system connections have been made.
- (10) LINE CORD
3-wire, heavy duty line cord connects to the main power line. The unit requires nominally 120v AC at 60Hz and is designed to work from 100 to 130 volts. Export models are equipped with 220v transformers, and will operate from 200 to 250 volts at 50 or 60Hz.
- (11) FUSE (located inside chassis, remove top cover to access)
The fuse, connected in series with the primary of the power transformer, must be 1/4 AMP, TYPE 3 AG. In export models the fuse must be reduced to 1/8 AMP, TYPE 3 AG. CAUTION: DO NOT REPLACE WITH HIGHER VALUE OR DIFFERENT TYPE.

SYSTEM CONNECTIONS

SINGLE CHANNEL 3-WAY SYSTEM

Connect components as shown below, then verify that all connections and protection circuits operate as detailed in the "VERIFICATION" section below. Set Mid frequency amplifier for 1.5 volts sensitivity for full output. With program material adjust high and subwoofer amplifiers for desired tonal balance.



VERIFICATION OF PROTECTION CIRCUIT OPERATION

Trace and verify all system connections before applying power; turn on amplifiers last, with gain controls at zero.

FUNCTIONAL VERIFICATION: The following procedure requires an audio generator and an amplifier capable of 40V rms output. This is the preferred method of checking the SMART system as it can be done at low output levels and it provides for a complete operational check of all protection circuits.

Sub Driver Section: Disconnect the subwoofer sense cable at the power amplifier and connect it to the output of the generator/amplifier combination. Turn the mid and high frequency amplifiers gain controls to zero, and adjust the subwoofer amplifier gain for a comfortable output with a high quality music source. Set the audio generator to 40 Hz and increase its level until the Sub Driver "excursion" LED comes on. It should be audible that the system low frequency cut-off has moved higher. Now adjust the audio generator to 200 Hz and increase the level until the Sub Driver "thermal" LED comes on. The output from the subwoofer(s) should decrease. Reconnect the subwoofer sense cable to the subwoofer amplifier before proceeding.

Mid Frequency Section: Disconnect the Mid sense cable at the power amplifier and connect it to the output of the generator/amplifier combination. Turn the sub and high frequency amplifier gains to zero and adjust the mid amplifier gain for a comfortable output. Set audio generator to 300 Hz and increase its level until the Mid "excursion" LED comes on. The sound from the Mid Range Driver should indicate that the crossover frequency moves higher. At a 1 KHz setting of the audio generator the Mid "thermal" LED should come on and the output from the Mid Driver should decrease. Reconnect the Mid sense cable to the Mid power amplifier output before proceeding.

High Frequency Section: Disconnect the H.F. sense cable at the power amplifier and connect it to the output of the audio generator/amplifier combination. Turn the sub and mid frequency amplifiers to zero. Set audio generator frequency to 400 Hz and increase its level until the H.F. "excursion" LED comes on. The sound from the H.F. Driver/Horn combination should indicate that the crossover frequency moves higher. At a 4 KHz setting of the audio generator the H.F. "thermal" LED should come on and the output from the H.F. Driver should decrease.

REFER TO SMART SOUND SYSTEMS OPERATION MANUAL FOR ALTERNATE FUNCTIONAL VERIFICATION.

TECHNICAL SPECIFICATIONS X3-M1

PROCESSOR SPECIFICATIONS

CROSSOVER SLOPE	: 18dB/octave
CROSSOVER FREQUENCIES	: 300Hz and 3KHz
INPUT IMPEDANCE	: 33 K ohm bal.
FREQUENCY RESPONSE (sum)	: +.5 dB 20-20 KHz (no EQ)
TOTAL HARMONIC & IM DIST.	: <.01% 20-20 KHz (no EQ)
HUM & NOISE	: < -91dBm 20-20 KHz (no EQ)
OVERALL GAIN	: 6dB 20-20 KHz (no EQ)
GROUP DELAY (100Hz-17 KHz)	: better than 1.5 msec
MAXIMUM INPUT VOLTAGE	: 6 V rms (21 dBm)
MAXIMUM OUTPUT VOLTAGE	: 6 V rms (22 dBm)
OUTPUT IMPEDANCE	: 300 ohm balanced
MINIMUM LOAD IMPEDANCE	: 500 ohm

INDICATORS

: POWER ON, EXCURSION & THERMAL OVERLOAD

DIMENSIONS (WxHxD)

: 19" x 1.75" x 8.5
(48.2 x 4.4 x 25.4 cm)

NET WEIGHT

: 6.5 lbs (3.0 kg)

SHIPPING WEIGHT

: 8.5 lbs (3.9 kg)

SYSTEM EQUALIZATION

LOW-FREQUENCY

: LOUDNESS COMPENSATION
: ENCLOSURE EQUALIZATION

HIGH-FREQUENCY

DRIVERS

: R-H SSD 3301 2" DRIVERS
: R-H CBH 820 & CBH 300

HORNS

SPT PROTECTION

PROTECTION SENSE IMP.

: 47 K ohm balanced
all inputs

SUBWOOFER PROTECTION

operates on

: LOUDNESS COMP., ENCLOSURE
E.Q. AND LOW-PASS GAIN

MID DRIVER PROTECTION

operates on

: CROSSOVER FREQUENCY AND
BAND-PASS GAIN

H.F. DRIVER PROTECTION

operates on

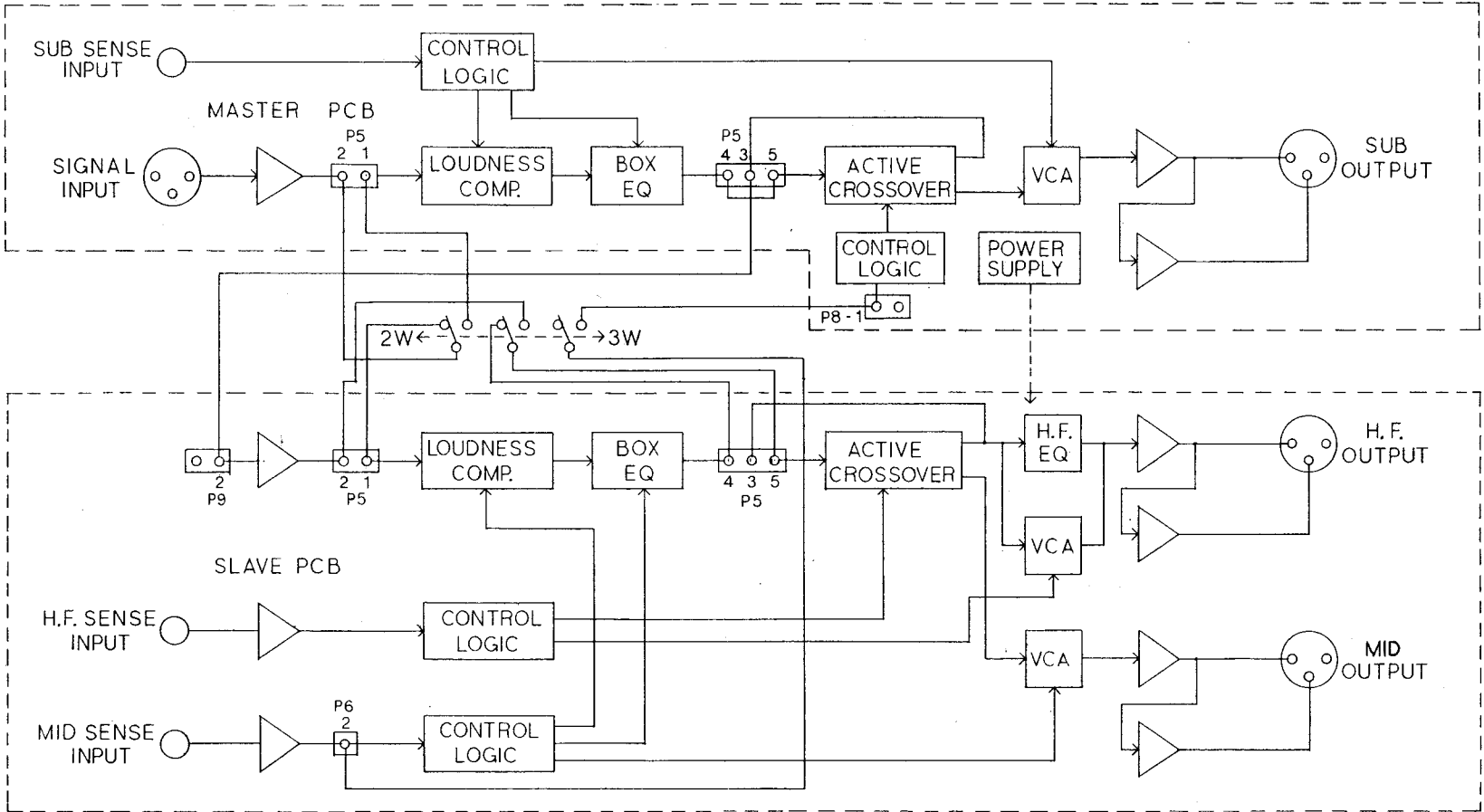
: CROSSOVER FREQUENCY AND
HIGH-PASS GAIN

POWER REQUIREMENTS

: 100-130v 50/60Hz
200-250v 50/60Hz
15 Watts maximum

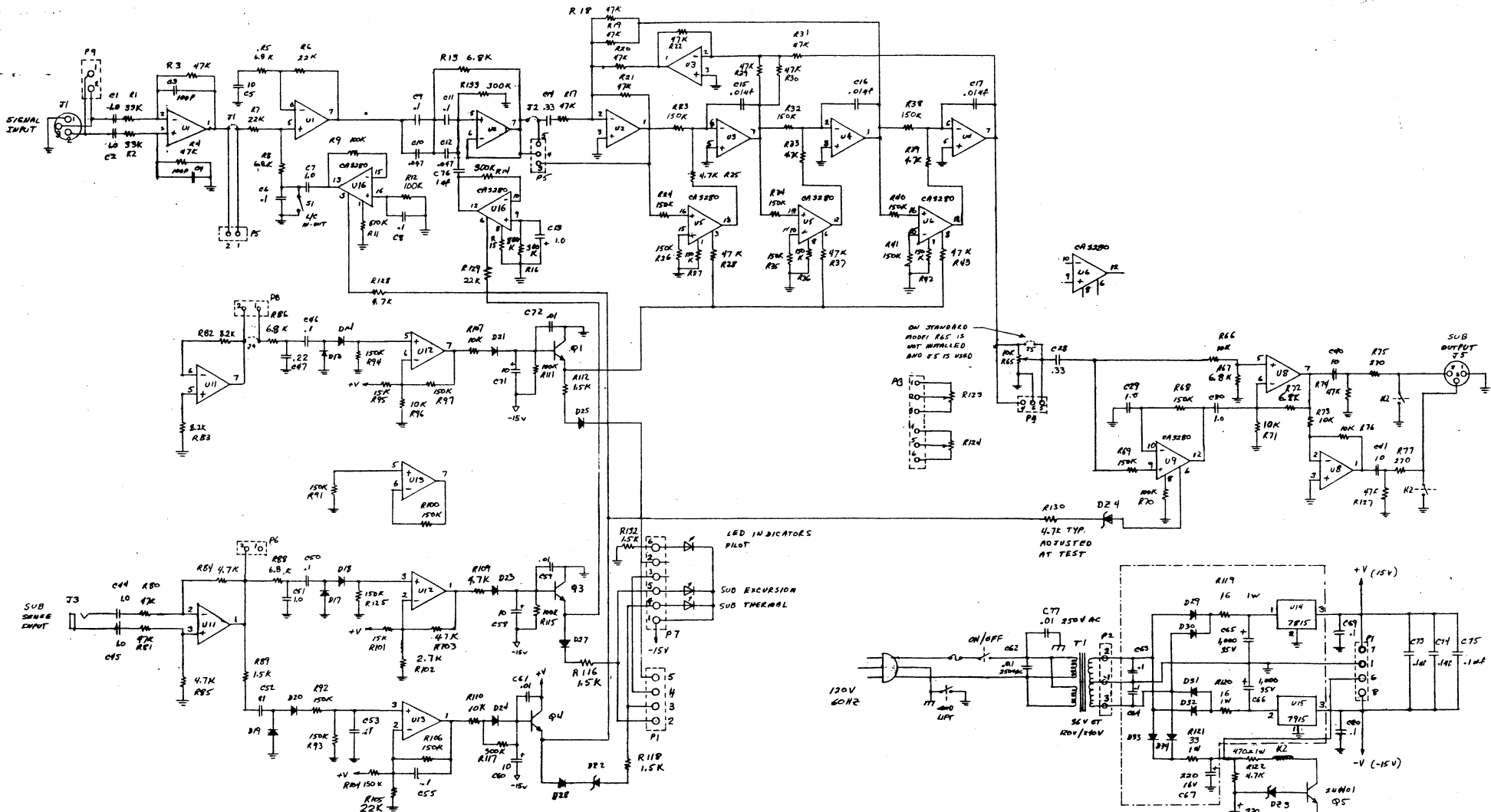
All specifications subject to change without notice

R-H RENKUS-HEINZ INC., MANUFACTURERS OF PROFESSIONAL AUDIO COMPONENTS AND SYSTEMS.
17191 ARMSTRONG AVE * IRVINE, CALIFORNIA 92714 * (714) 250-0166 * TELEX 705568 (R H INC UD)



X3-M1 DELETES THE 2W-3W SWITCH AND IS WIRED 3 WAY

TOLERANCES UNLESS OTHERWISE SPECIFIED		RENKUS-HEINZ	
APPROVALS	DATE	X3 BLOCK DIAGRAM	
CHECKED	10-27-82	SCALE	SIZE D SCH X3
		DO NOT SCALE DRAWING	SHEET



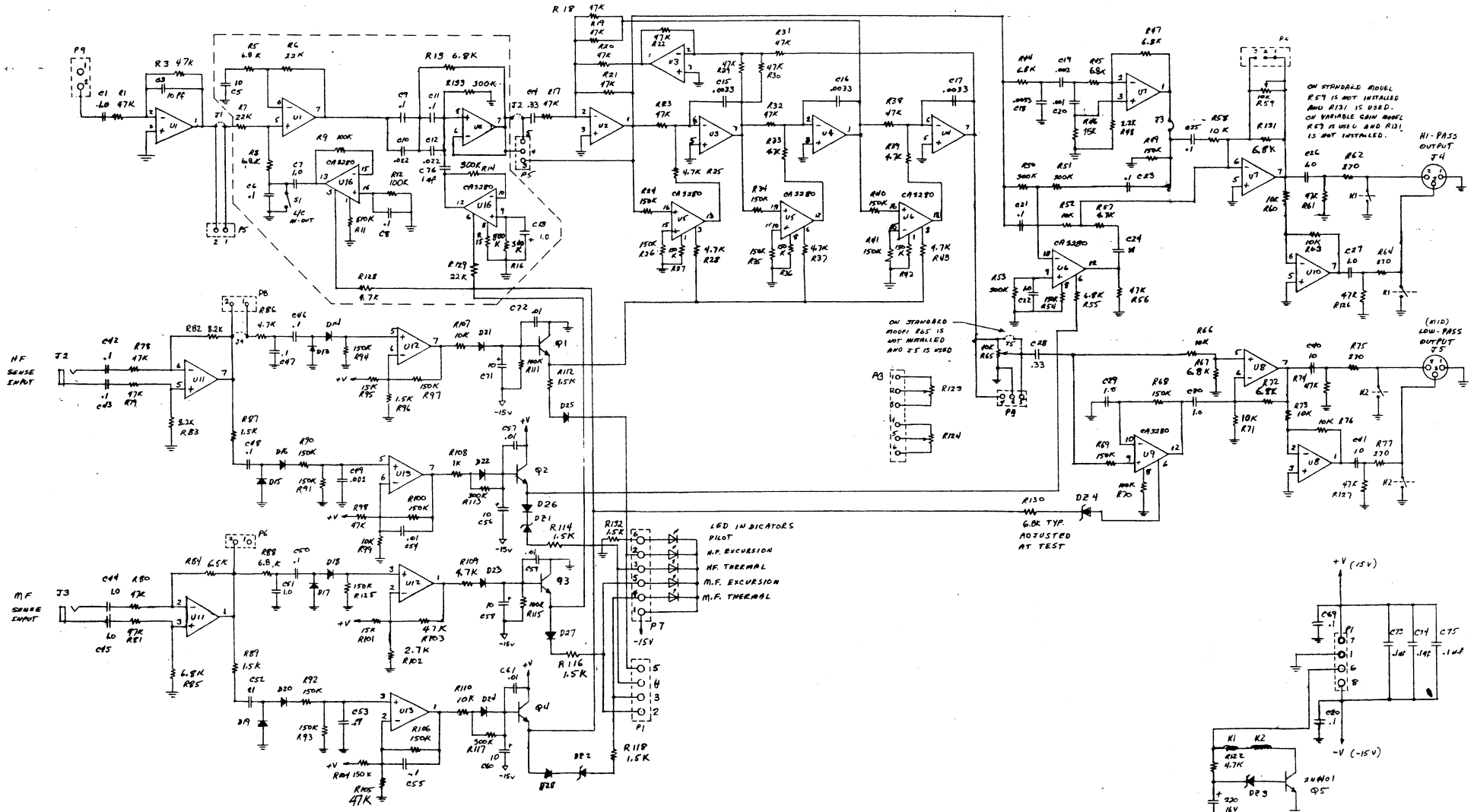
- 6. C9, 10, 11, 12, 15, 16, 17 ARE ± 5%
 - 5. BENEYS ARE 5V
 - 4. IC'S ARE 4560
 - 3. DIST28 ARE IN 4148 D27-34 ARE IN 4004
 - 2. CAPACITORS ARE IN MICROFARADS ± 10%, 100V
 - 1. RESISTORS ARE IN OHMS, ± 1%, 1/4 WATT
- NOTES: UNLESS OTHERWISE SPECIFIED

LAST DESIGNATION USED:
 T1, S1, 35, P8, 32A, 83A
 R132, C77, U5, 85

X3, X3-12 MASTER - AS SHOWN
 X3-M1 MASTER - CHANGE VALUES AS FOLLOWS
 R23, 32, 38 = 56K
 R28, 37, 43, 67, 72, 131 = 4.7K
 R86 = 18K
 R96 = 1.5K
 C47 = .22UF

H	RIDS WAS 47K E00141	7/24/80
G	SEE SLAVE SCH.	
F	ADDED X3-12	2/16/77
E	CORRECTED TO MATCH PRODUCTION	8/14/76
D	E00190	2/10/76
C	EC = 87	8/14/76
B	UNNOTED THROUGH E00190	8/17/75
A	CHANGE 1 EQ	3/27/75

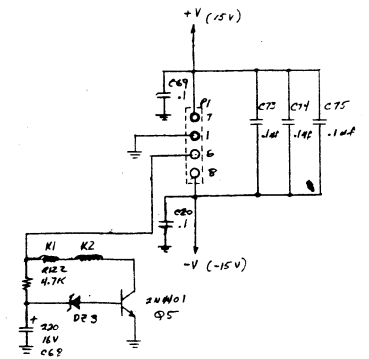
REVISIONS		DATE	REVISIONS	DATE	REVISIONS
NO.	DESCRIPTION	DATE			
RENKUS-HEINZ INC					
SCHEMATIC X3, X3-M1 MASTER PCB					
SIZE	CODE	DEPT. NO.	WORKING NO.		
D				SCH X3 MSTR	



6. C9, 10, 11, 12, 15, 16, 17 ARE $\pm 5\%$
 5. RESISTORS ARE 5V
 4. IC'S ARE 4560
 3. DIODES ARE IN 4148 D27-34 ARE IN 4004
 2. CAPACITORS ARE IN MICROFARADS $\pm 10\%$, 100V
 1. RESISTORS ARE IN OHMS, $\pm 1\%$, 1/4 WATT
- NOTES: UNLESS OTHERWISE SPECIFIED

LAST DESIGNATION USED:
 T1, S1, J5, PB, D24, D34
 R132, C77, U15, Q5

X3 SLAVE - AS SHOWN
 X3 M1 SLAVE - CHANGE VALUES AS FOLLOWS
 R23, 32, 38 = 22K
 C53 = .001MFD; C55 = .01MFD
 R104 = 100K; R86 = 4.7K; R110 = 1K
 DELETE PARTS IN DASH BOX
 X3-12 SLAVE - CHANGE VALUES AS FOLLOWS
 C15, 16, 17 = .0022MFD
 R98 = 68.1K; R102 = 3.9K; R55 = 4.7K
 DELETE C10 + C12



H. SFE SHEET 1		7/24	
Q	CHANGED RES TO 4.7K ON X3-12	CONTRACT NO.	
F	ADDED X3-12 VALUES	2/16/87	DATE
E	CORRECTED TO MATCH PRODUCTION	R.H.	1/23/87
D	ECO # 89	R.V.	8/16/86
C	ECO # 89		
B	UPDATED THROUGH ECO #0		
A	CHANGE 2' EQ		
DESCRIPTION		DATE	

RENKUS-HEINZ INC	
SCHEMATIC X3/X3M1 SLAVE	
B	CODE IDENT NO.
SCH X3 SLV	
SCALE	SHEET 2 OF 3