MARTI ELECTRONICS, INC.
P. O. Box 661
1501 N. Main Street
Cleburne, Texas 76031

RMC 15

REMOTE CONTROL SYSTEM

MODEM MANUAL

(A SUPPLEMENT TO BE USED WITH THE GENERAL INSTRUCTION MANUAL)

WARRANTY:

Except as otherwise provided in this section, the equipment described herein is sold under the following guarantee:

Marti agrees to repair or replace within a one (1) year period and without charge, any equipment or parts which are defective as to workmanship or material and which are returned to Marti at its factory, transportation prepaid and properly insured, provided:

(a) Notice of the claimed defect is given Marti within one (1) year from date appearing on invoice and goods are returned in accordance with Marti instructions.

(b) Equipment, accessories, tubes and batteries not manufactured by Marti are subject to only such adjustments as Marti may obtain from the supplier thereof.

(c) Equipment or accessories shall not be deemed to be defective if, after examination by Marti or its appointed representative, the equipment evidences damage from moisture, improper handling, installation or operation.

(d) In the event that Marti is required to demonstrate equipment capability either as to specifications or defects in parts or workmanship and where it is found that the equipment meets specifications, Marti shall be entitled to collect all reasonable expenses from the Buyer including but not limited to, travel, per diem living expenses and hourly wage rates which have been established by Marti and which are in effect at the time.

Marti further guarantees that any radio transmitter described herein will deliver specified radio frequency power output at the antenna load when connected to a suitable load, but such guarantee shall not be construed as a guarantee of any definite coverage or range of said apparatus. The guarantee of these paragraphs is void if equipment is altered or repaired by others than Marti or its authorized service Representative, or unless specifically authorized in writing by Marti. No other warranties, expressed or implied, shall be applicable to any equipment sold hereunder, and the foregoing shall constitute the Buyer's sole right and remedy under the agreements contained in this paragraph. In no event shall Marti have any liability for consequential damages, or for loss, damage or expense directly or indirectly arising from the use of the products, or any inability to use them either separately or in combination with other equipment or materials, or from any other cause.

JANUARY 1, 1982

SECTION VII--MODEM

SECTION VIII-PRINCIPAL ACCESSORIES

SECTION IX-SELECTED SYSTEM CONFIGURATIONS

SECTION VII
MODEM

DESCRIPTION

The function of the Modem as installed within the RMC 15 Remote Control System is to transform serial logic from UART's into analog FSK signals, furnish the appropriate transmit clock frequency for parallel to serial conversion, supply a sample for the monitoring of the output level, provide a sample of the incoming signal, detect serial logic from an incoming analog sample, and furnish the appro-iate receive clock frequency for serial to parallel conversion.

Various models can accomodate the different combinations of mod (output) and demod (input) FSK signals with the use of plug-in boards to the substrates.

The stability of the circuit is due to the crystal oscillator frequency source which results in discrete, predictable frequencies, and the use of innova-tive circuitry premiering in this assembly.

There are two types of substrates. The basic difference is in the handling of the transmit and receive clocks, whether either or both is fixed or synchronous with the signal frequency. In the standard design of the RMC 15 Remote Control System, the synchronous substrate, 800-138-5, is used in all Transmitter Units, and in all Studio Units except where subaudible telemetry is being received. The subaudible mod board in the Transmitter Unit generates a fixed clock rate of 90 or 100 Hz., but the subaudible demod in the Studio Unit does not have clock gen-eration circuitry; therefore, the fixed substrate, 800-157, which has the necessary modulus circuit, is used.

NORMAL OPERATION

The mod function of the assembly automatically operates to produce FSK signals under direction of the UART's on the Main Logic Boards. The exact frequencies are set by the plug-in Mod Board located on the end of the Modem Substrate Board containing the LM380 amplifier circuit. Each Mod Board has two terminals. By grounding one of these terminals, the output of the assembly is killed. Grounding the other forces only the higher of the two FSK frequencies to be sent.

The demod function of the assembly operates to sense the presence of incoming signal, and decodes the frequencies to the logic signals necessary for the receiving UART's. The small red light emitting diode follows the incoming signal, being illuminated with the presence of the low tone or in the absence of signal, and being off in the presence of the high tone. When receiving an FSK signal, the LED will flicker in rythmical flashes as the bits of the signal are decoded.

All mounting screws should be in place to promote proper operation in high RF environments. When removing and replacing plug-in boards, care should be taken to assure that substrate disc capacitors remain bent as flat as practical to the board and integrated circuits are not inadvertently removed from their sockets on the substrate.

THEORY OF OPERATION

CRYSTAL OSCILLATOR

The crystal oscillator provides a frequency source for the mod and demod functions of the modem. The particular circuit provides a TTL level square wave to the extending circuitry.

FREQUENCY SYNTHESIS

This section of the mod circuitry produces an FSK squarewave signal. Each cycle of output is generated as an even division of the oscillator. Frequency changes are implemented by strobing in the logic level of the DCD from the transmitting UART, to give a count goal at the point at which the mod counter circuit is reset to zero. At the selected count of oscillator pulses, the circuit is reset, strobing in the DCD logic level, and the cycle continues. The reset pluses are divided by two to give a square wave output from this section. The grounding of the disable line blocks the frequency division of the pulses, and the grounding of the high frequency hold line causes the circuit to cycle only to the count required for producing the high frequency.

SYNCHRONOUS TRANSMIT CLOCK GENERATION

The transmit clock frequency is divided from the mod frequency. Such division means that the clock frequency will vary with the mod frequency.

FIXED TRANSMIT CLOCK GENERATION

In the subaudible mod scheme, the oscillator frequency is first divided down to 45 KHz., then this frequency is fed to the mod synthesis circuit instead of the oscillator frequency and is also divided by a modulus circuit to produce a transmit clock frequency of 90 or 100 Hz.

WAVE SHAPING AND AMPLIFIER OUTPUT

The plug-in Mod Board has necessary circuitry for production of a suitable sine wave from the FSK square wave. The signal is then amplified on the Modem

THEORY OF OPERATION CONTINUED

WAVE SHAPING AND AMPLIFIER OUTPUT,Continued

Substrate Board and the appropriate output circuits are selected by pin connections on the Mod Board.

The output pot with access from the front panel of the Transmitter or Studio Unit should be adjusted for a SET level. The circuitry of the Mod board is calibrated to produce the right sample voltage necessary to calibrate the output level for most applications.

INPUT FILTERING AND DIGITAL WAVE FORM PRODUCTION

Depending on the frequency and applications, several stages of filtering are used to select the desired component for the input signal. These stages may be any or all of the following: RC filter, LC filter, active filter, limiter, or tracking filter.

Using a zero-crossing detector or driving a transistor to saturation produces a usable square wave for TTL frequency division and FSK detection.

SYNCHRONOUS RECEIVE CLOCK GENERATION

The square wave is divided to produce the receive clock frequency. The division is determined by choice of integrated circuits and programming jumpers.

FIXED RECEIVE CLOCK GENERATION

The receive clock for subaudible is generated on the Modem Substrate Board in a similar manner to its generation on the Subaudible Mod Board.

DIGITAL DEMOD REFERENCE CLOCK AND FSK INPUT TO DIGITAL DEMOD

To simplify troubleshooting, a slower frequency than the oscillator frequency is used for measuring the period of the unknown FSK wave form. This reference frequency is determined either by a modulus circuit for the sychronous frequencies or by simple divider chains for subaudible.

The other necessary input frequency to the demod is the unknown itself. This input is divided from the input signal to produce 50% duty cycle square wave, or for the subaudible is taken directly from the zero-crossing detector found on the substrate.

THEORY OF OPERATION CONTINUED

FSK DETECTION

The scheme involves determining whether the period of the unknown frequency is above or below a certain length. The longer the period, the lower the frequency. And, a shorter period indicates a higher frequency. A zone of indecision exists due to the choice of reference clock frequency, but it is only a fraction of the FSK deviation. This circuit detects each cycle of frequency, and outputs the resultant DCD level. The actual number of cycles necessary for FSK detection output depends on the fractional proportion of the frequency of the original signal to the divided square wave input to the demod of that signal.

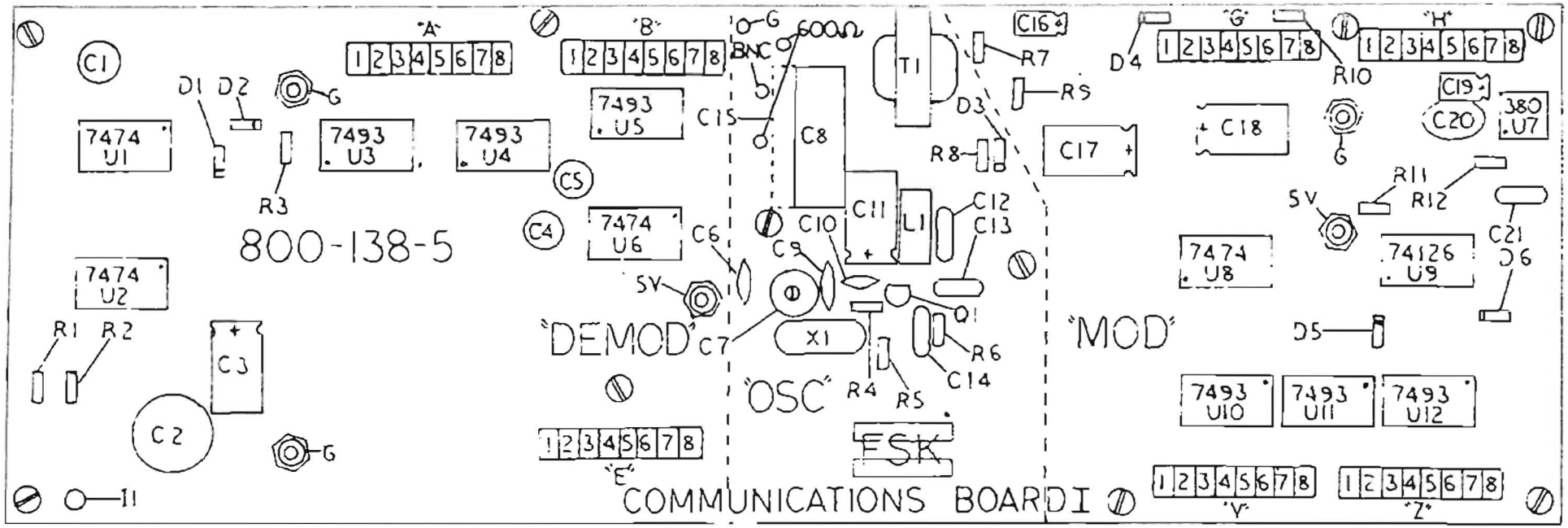
MOLEX PINOUTS ON COMMUNICATIONS BOARDS

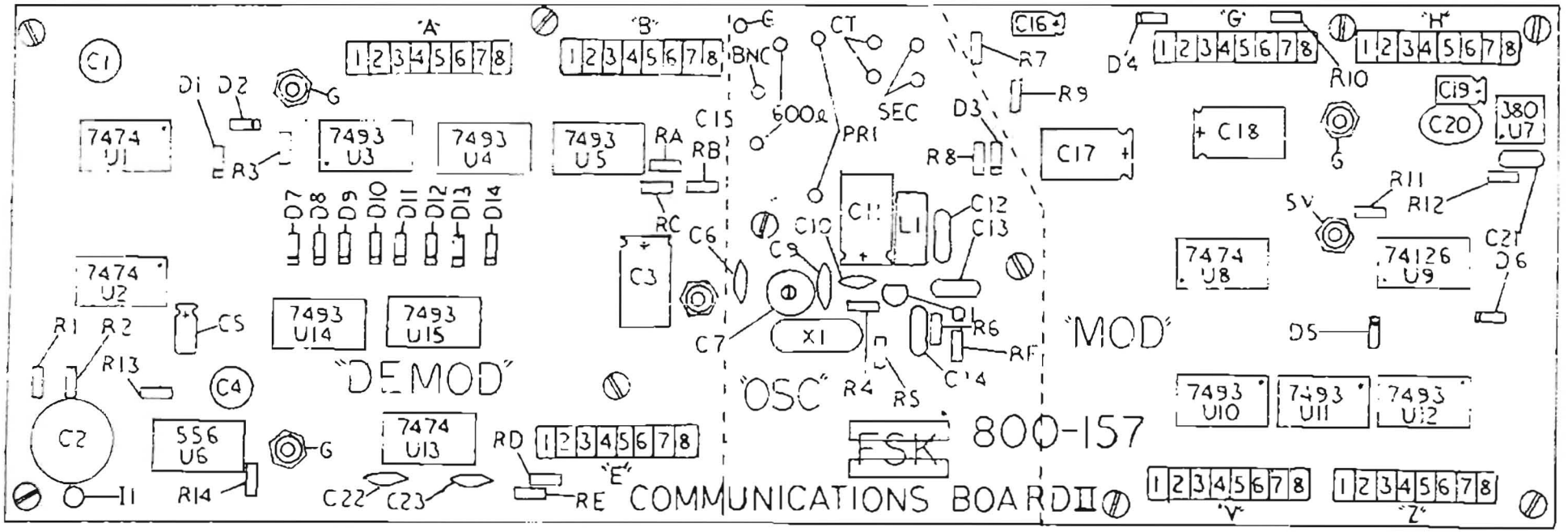
COMMUNICATIONS BOARD I, 800-138-5

A1--Demod Count Return
A2--Demod Count Program 2
A3--Demod Count Program 4
A4--Demod Count Program 8
A5--Demod Count Program 16
A6--Demod Count Program 32
A7--Demod Count Program 64
A8--Demod Count Program 128
B1--Demod Clock Return
B2--Demod TTL Input
B3--Demod Clock Program A
B4--Demod Clock Program D
B5--Demod Clock Program B
B6--Demod Clock Program C
B7--BNC Input
B8--600 ohm Input
E1--Receive Clock
E2--Ground
E3--Input Level Tap
E4--Demod Clock Reset
E5--Twelve Volt Source
E6--Wiper of Input Pot
E7--Top of Input Pot
E8--Five Volt Source
G1--BNC Output
G2--600 ohm Output
G3--2F Mod Pulse
G4--Output Level Tap
G5--Transmit Clock
G6--Top of Output Pot
G7--Wiper of Output Pot
G8--Twelve Volt Source
H1--Five Volt Source
H2--Grounding Disables Mod
H3--Buffered Crystal Frequency
H4--Ground
H5--Mod Amp Input
H6--Grounding Holds Mark
H7--Twelve Volts to Amp
H8--Mod Amp Output
V1--Mod Count Program 2048
V2--Mod Count Program 1024
V3--Mod Count Program 512
V4--Mod Count Program 256
V5--Mod Count Program 128
V6--Mod Count Program 64
V7--Mod Count Program 32
V8--Mod Count Program 16
Z1--Mod Count Program 8
Z2--Mod Count Program 4
Z3--Mod Count Program 2
Z4--Mod Count Program 1
Z5--Mod Frequency Source Input
Z6--High Frequency Return
Z7--Low Frequency Return
Z8--Common Frequency Return

COMMUNICATIONS BOARD II, 800-157

A1--Demod Count Return
A2--Demod Count Program 2
A3--Demod Count Program 4
A4--Demod Count Program 8
A5--Demod Count Program 16
A6--Demod Count Program 32
A7--Demod Count Program 64
A8--Demod Count Program 128
B1--Demod Count Program 256
B2--Demod Count Program 512
B3--Demod Count Program 1024
B4--Demod Count Program 2048
B5--Demod Clock Input
B6--Demod TTL Input
B7--BNC Input
B8--600 ohm Input
E1--Receive Clock
E2--Ground
E3--Input Level Tap
E4--Buffered Crystal Frequency
E5--Twelve Volt Source
E6--Wiper of Input Pot
E7--Top of Input Pot
E8--Five Volt Source
G1--BNC Output
G2--600 ohm Output
G3--2F Mod Pulse
G4--Output Level Tap
G5--Transmit Clock
G6--Top of Output Pot
G7--Wiper of Output Pot
G8--Twelve Volt Source
H1--Five Volt Source
H2--Grounding Disables Mod
H3--Buffered Crystal Frequency
H4--Ground
H5--Mod Amp Input
H6--Grounding Holds Mark
H7--Twelve Volts to Amp
H8--Mod Amp Output
V1--Mod Count Program 2048
V2--Mod Count Program 1024
V3--Mod Count Program 512
V4--Mod Count Program 256
V5--Mod Count Program 128
V6--Mod Count Program 64
V7--Mod Count Program 32
V8--Mod Count Program 16
Z1--Mod Count Program 8
Z2--Mod Count Program 4
Z3--Mod Count Program 2
Z4--Mod Count Program 1
Z5--Mod Frequency Source Input
Z6--High Frequency Return
Z7--Low Frequency Return
Z8--Common Frequency Return


800-138-5
"DEMOD"
"OSC"
"MOD"
FSK
COMMUNICATIONS BOARD I
7474 U1
7493 U3
7493 U4
7493 U5
7474 U6
7474 U2
7474 U8
74126 U9
7493 U10
7493 U11
7493 U12
380 U7
BNC
600Ω
T1
X1
L1
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
R1
R2
R3
R4
R5
R6
R7
R8
R10
R11
R12
D1
D2
D3
D4
D5
D6
Q1
5V
G
E
V
Z


800-157
"DEMOD"
"OSC"
"MOD"
FSK
COMMUNICATIONS BOARD II
7474 U1
7493 U3
7493 U4
7493 U5
7493 U14
7493 U15
7474 U13
556 U6
7474 U2
7474 U8
74126 U9
7493 U10
7493 U11
7493 U12
380 U7
BNC
600Ω
CT
SEC
PRI
X1
L1
C1
C2
C3
C4
C5
C6
C7
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
C23
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
RA
RB
RC
RD
RE
RF
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D13
D14
5V
G
E
V
Z

MODEM INTERFACE CABLES

Two cables are attached to the modem assembly, the FSK cable to the UART's on the main logic boards, and the 4-wire cable to the Communications Input/Output Board which is the I/O port to the external world from the unit.

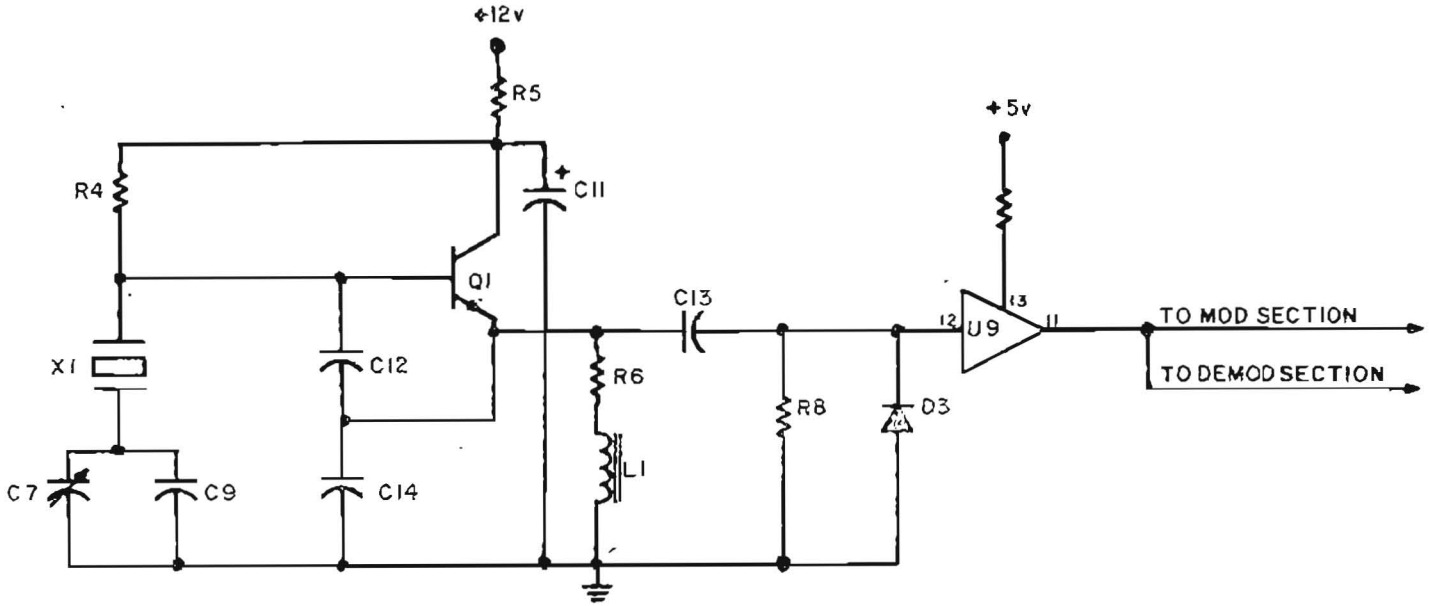
The FSK cable is a sixteen-wire flat cable fitted with female DIP connectors which mate with sixteen pins on the Modem Substrate Board and the Main Logic Board in either the Studio or the Transmitter Unit. The code is as follows, (a spot on the bottom of the Modem Substrate Board near the pins identifies pin one):

FSK Cable

1--Twelve Volt Mod Source
2--Wiper of Output Pot
3--Top of Output Pot
4--Transmit Clock
5--Five Volt Source
6--Twelve Volt Demod Source
7--Wiper of Input Pot
8--Top of Input Pot
9--Input Sample
10--Demod DCD Output
11--Receive Clock
12--Ground
13--Ground
14--Mod DCD Input
15- Grounding Disables Mod
16--Output Sample

The 4-wire cable connects the Modem Substrate Board to the Communications I/O Board. These lines ultimately connect to the ground and 600 ohm terminals on the rear of the unit, and to the BNC connector. The wire code to this cable is as follows:

white--ground
orange--BNC
yellow pair--600 ohm



MARTI Electronics Inc. PO BOX 661 CLEBURNE, TX 76031	DRAWING NO	REV.	DATE	APPROVED	USED ON	TITLE
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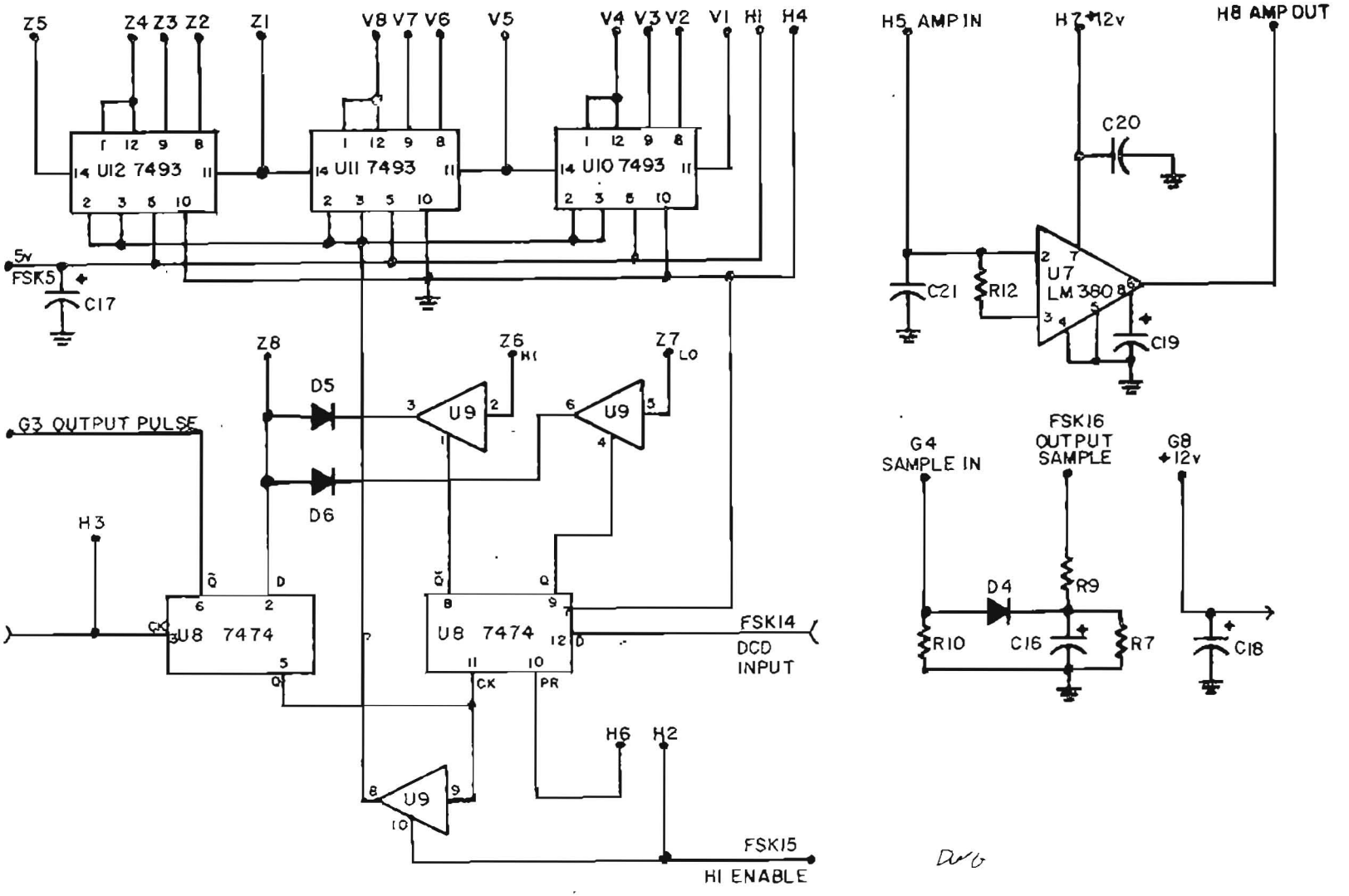
910-004



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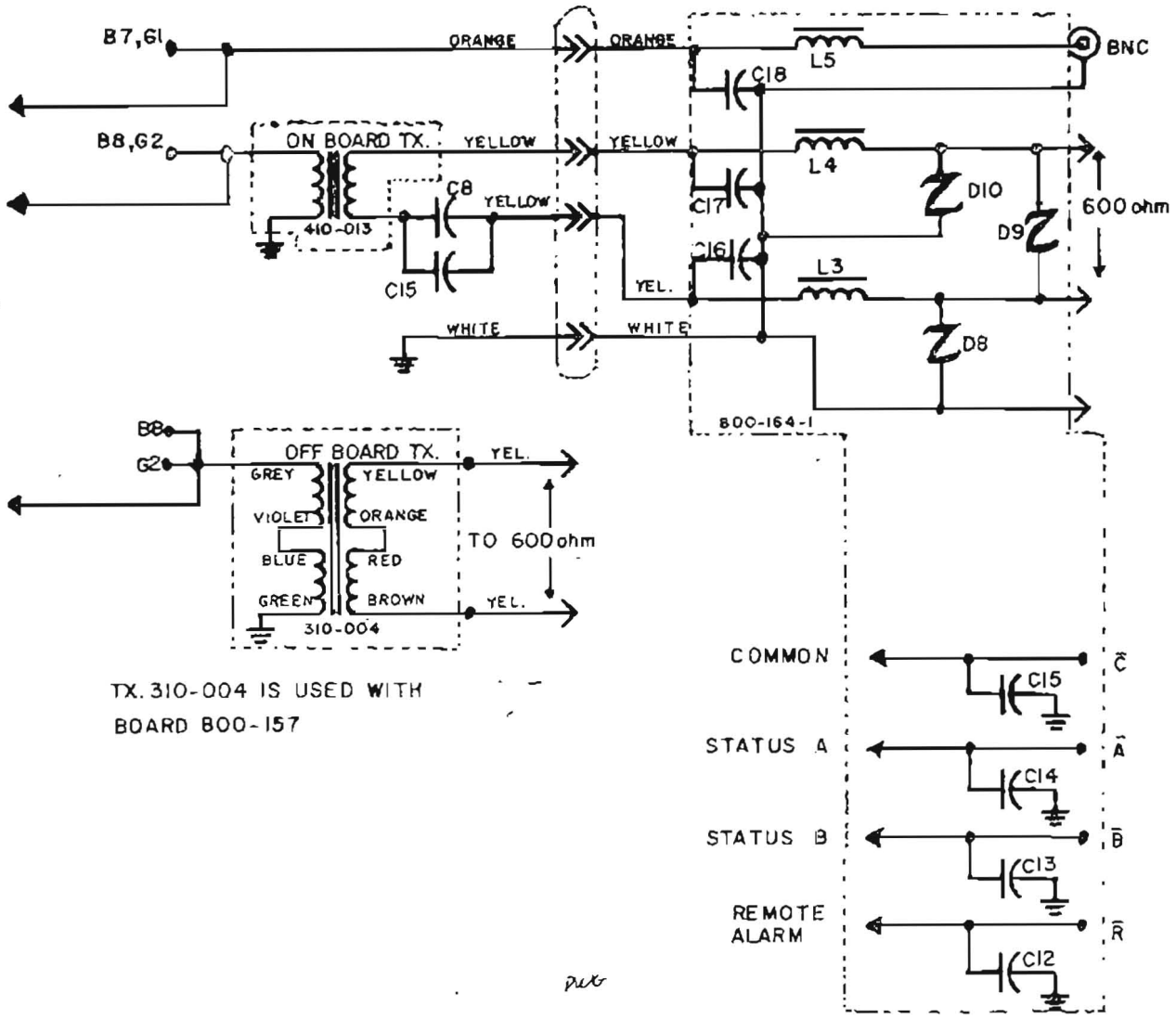
	702-027		5-26-81		RMC 15	MOD SUBSTRATE



TX. 310-004 IS USED WITH
BOARD 800-157

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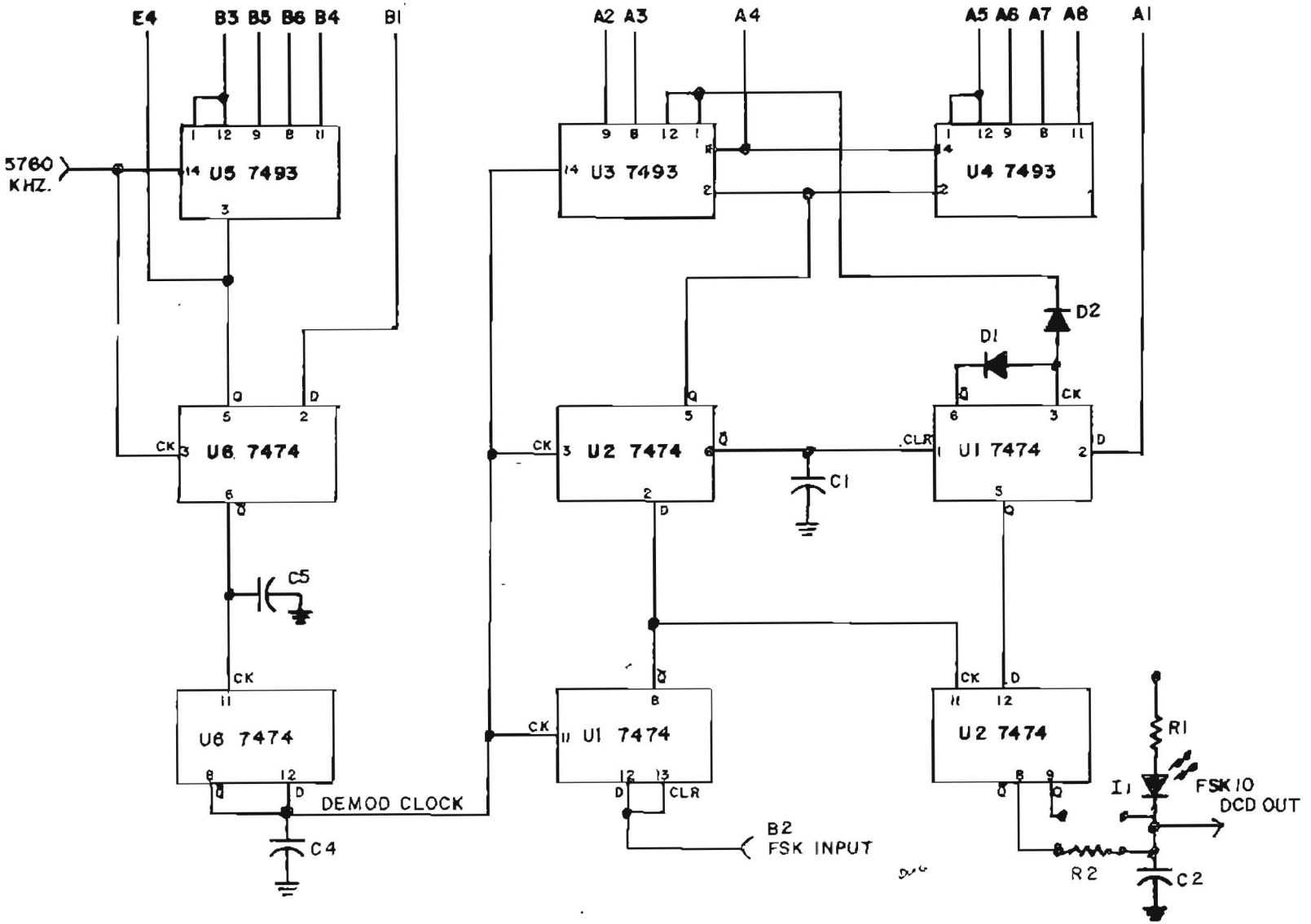
	702-026		5-27-81		RMC 15	COMMUNICATIONS INPUT/OUTPUT

910-004



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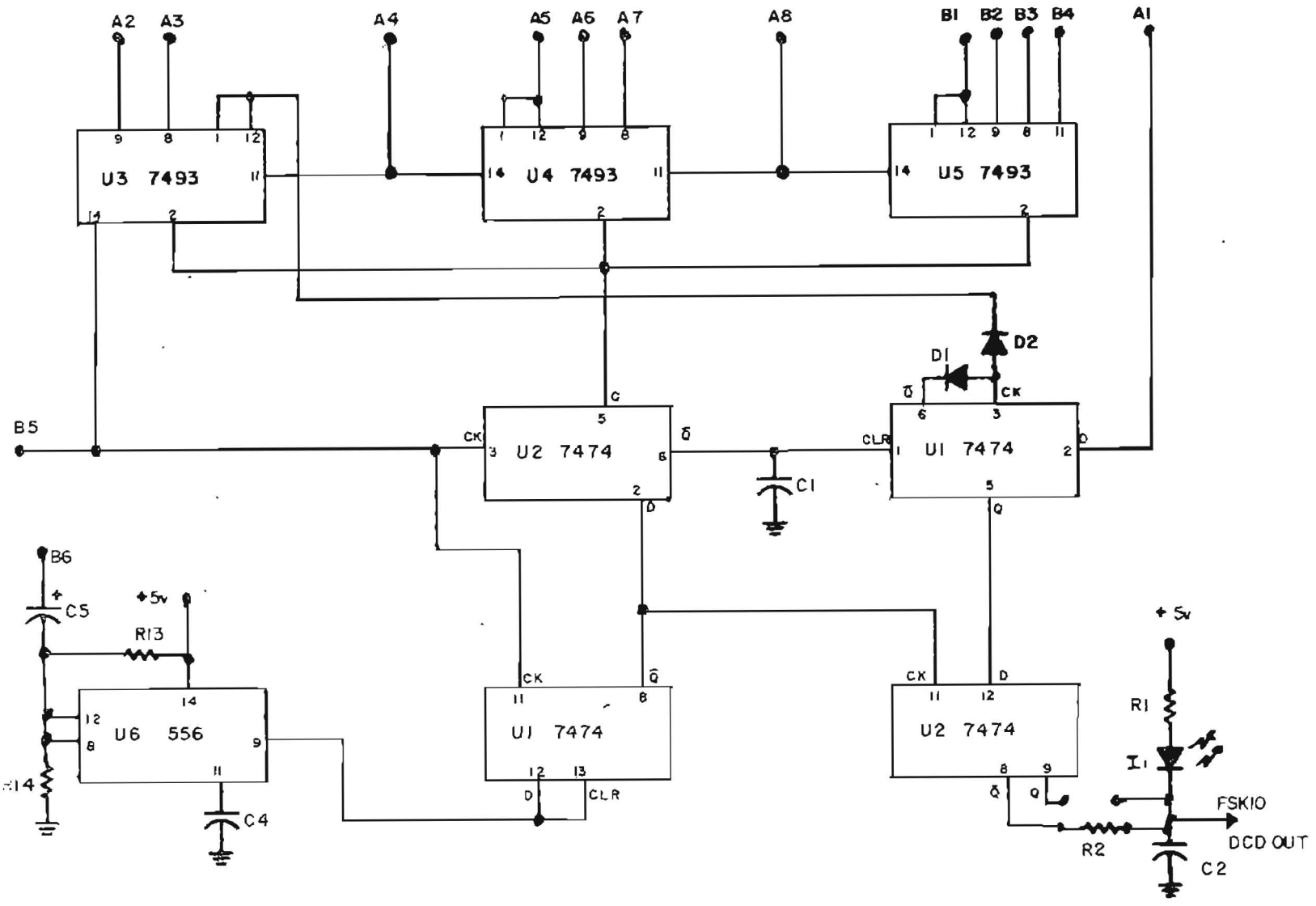
	800-138-5		5-27-81		RMC 15	TTL DEMOD, SUBSTRATE I

910-004



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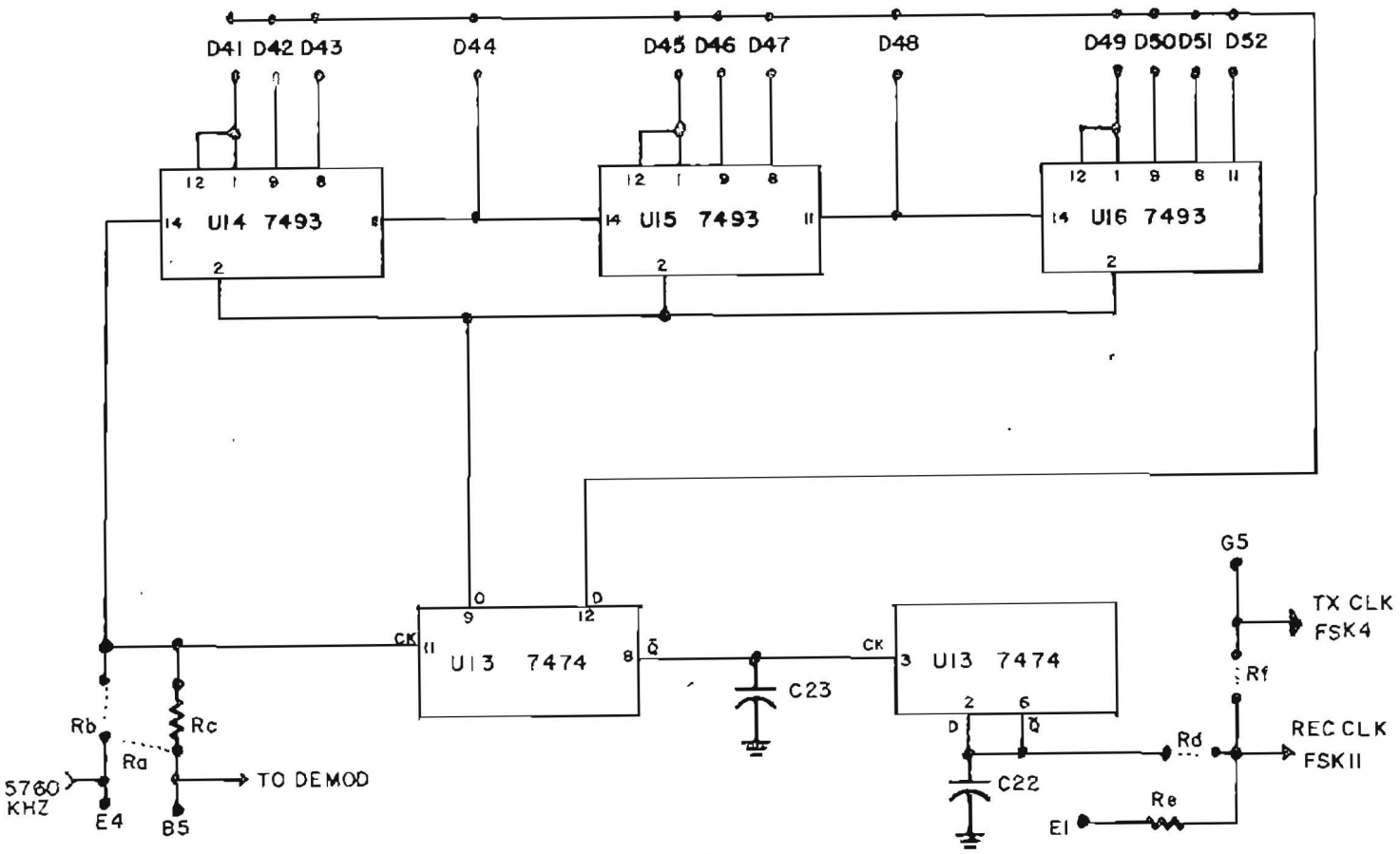
MARTI Electronics, Inc. PO BOX 661 CLEBURNE, TX 76031	DRAWING NO	REV.	DATE	APPROVED	USED ON	TITLE
	800-157		5-28-81		RMC 15	TTL DEMOD, SUBSTRATE II

910-004



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	800-157		5-28-81		RMC 15	BAUD RATE, SUBSTRATE II

910-004

PARTS LIST
RMC 15S/T
COMMUNICATIONS SUBSTRATE I

REF.	MARTI P/N	DESCRIPTION
B1	800-138-5	PC Board, Communications Board I
C1	217-104	Capacitor, .01 uF Discap
C2	217-103	Capacitor, .1 uF Disc 25V
C3	219-251	Capacitor, 220 uF 25V
C4,C5	255-470-1	Capacitor, 47 pF 5% N330
C6	256-471	Capacitor, 470 pF 10% X5F
C7	230-610	Capacitor, 2-60 pF
C8	226-020	Capacitor, 2.2 uF 100V 10%
C9	255-220	Capacitor, 22 pF NPO 5%
C10	217-104	Capacitor, .01 uF Discap
C11	219-251	Capacitor, 220 uF 25V
C12,C13	255-161	Capacitor, 160 pF Mica
C14	255-271	Capacitor, 270 pF Mica
C15	226-020	Capacitor, 2.2 uF 100V 10%
C16	219-200	Capacitor, 22 uF 25V
C17,C18	219-251	Capacitor, 220 uF 25V
C19	219-200	Capacitor, 22 uF 25V
C20	217-103	Capacitor, .1 uF Disc 25V
C21	255-161	Capacitor, 160 pF Mica
D1-D6	410-914	Diode, Silicon 1N914/1N4148
I1	410-951	LED, Red TIL-220
L1	330-004	Choke, 100 uH
Q1	425-301	Transistor, NPN 2N3904
R1	145-561	Resistor, 560 ohm 1/4 W
R2	145-030	Resistor, 3.3 ohm 1/4 W
R3	145-103	Resistor, 10K 1/4 W
R4	145-104	Resistor, 100K 1/4 W
R5	145-470	Resistor, 47 ohm 1/4 W
R6	145-331	Resistor, 330 ohm 1/4 W
R7	145-104	Resistor, 100K 1/4 W
R8	145-562	Resistor, 5.6K 1/4 W
R9	145-030	Resistor, 3.3 ohm 1/4 W
R10	145-222	Resistor, 2.2K 1/4 W
T1	310-013	Transformer, 600-600 ohm
U1,U2	407-474	TTL IC, 7474
U3-U5	407-813	TTL IC, 7493
U6	407-474	TTL IC, 7474
U7	400-380	Linear IC, LM380
U8	407-474	TTL IC, 7474
U9	408-094	TTL IC, 74126/8094
U10-U12	407-813	TTL IC, 7493
X1	010-5760 KHz	Crystal, HC6 Fundamental Type

PARTS LIST
RMC 15S
COMMUNICATIONS SUBSTRATE II

REF.	MARTI P/N	DESCRIPTION
B1	800-157	PC Board, Communications Board II
C1	217-104	Capacitor, .01 uF Discap
C2	217-103	Capacitor, .1 uF Disc 25V
C3	219-251	Capacitor, 220 uF 25V
C4	217-104	Capacitor, .01 uF Discap
C5	219-200	Capacitor, 22 uF 25V
C6	256-471	Capacitor, 470 pF 10% X5F
C7	230-610	Capacitor, 2-60 pF
C8		Omit
C9	255-220	Capacitor, 22 pF NPO 5%
C10	217-104	Capacitor, .01 uF Discap
C11	219-251	Capacitor, 220 uF 25V
C12,C13	255-161	Capacitor, 160 pF Mica
C14	255-271	Capacitor, 270 pF Mica
C15		Omit
C16	219-200	Capacitor, 22 uF 25V
C17,C18	219-251	Capacitor, 220 uF 25V
C19	219-200	Capacitor, 22 uF 25V
C20	217-103	Capacitor, .1 uF Disc 25V
C21	255-161	Capacitor, 160 pF Mica
C22,C23	255-470-1	Capacitor, 47 pF 5% N330
D1-D14	410-914	Diode Silicon 1N914/1N4148
I1	410-951	LED, Red TIL-220
L1	330-004	Choke, 100 uH
Q1	425-301	Transistor, NPN 2N3904
R1	145-561	Resistor, 560 ohm 1/4 W
R2	145-030	Resistor, 3.3 ohm 1/4 W
R3	145-103	Resistor, 10K 1/4 W
R4	145-104	Resistor, 100K 1/4 W
R5	145-470	Resistor, 47 ohm 1/4 W
R6	145-331	Resistor, 330 ohm 1/4 W
R7	145-104	Resistor, 100K 1/4 W
R8	145-562	Resistor, 5.6K 1/4 W
R9	145-030	Resistor, 3.3 ohm 1/4 W
R10	145-222	Resistor, 2.2K 1/4 W
R11	145-103	Resistor, 10K 1/4 W
R12	145-105	Resistor, 1 Meg 1/4 W
R13,R14	145-104	Resistor, 100K, 1/4 W
RA,RF	145-030	Resistor, 3.3 ohm 1/4 W
T1	310-004	Transformer, 600-600 ohm

PARTS LIST
RMC 15S
COMMUNICATIONS SUBSTRATE II

REF.	MARTI P/N	DESCRIPTION
U1,U2	407-474	TTL IC, 7474
U3-U5	407-813	TTL IC, 7493
U6	400-556	Linear IC, LM556
U7	400-380	Linear IC, LM380
U8	407-474	TTL IC, 7474
U9	408-094	TTL IC, 74126/8094
U10-U12	407-813	TTL IC, 7493
U13	407-474	TTL IC, 7474
U14,U15	407-813	TTL IC, 7493
X1	010-5760 KHz	Crystal, HC6 Fundamental Type

STANDARD FREQUENCIES

DESIGNATION	USE	TYPE	STD. CLOCK	LOW FREQ.	HIGH FREQ.
66 KHz.	Control	B,C	2 KHz.(/32)	65,455	66,977
2400 Hz.	Control	A,D,E	1200 Hz.(/2)	2350	2450
2400 Hz.	Telemetry	B,D	1200 Hz.(/2)	2350	2450
950 Hz.	Telemetry	A	475 Hz.(/2)	925	975
Subaudible	Telemetry	C,E	90 or 100 Hz.	23.5	26.5

COMMON OPTIONAL FREQUENCIES

DESIGNATION	USE	TYPE	STD. CLOCK	LOW FREQ.	HIGH FREQ.
40 KHz.	Control	B,C	2 KHz.(/20)	39,452	40,563
27 KHz.	Control	B,C	1.7 KHz.(/16)	26,667	27,428

TTL DIVISION FORMULAE

INTEGRATED CIRCUIT	USEFUL FREQUENCY DIVISIONS
7490	2, 5, 10
7492	2, 6, 12
7493	2, 4, 6, 8, 16

MODULUS CIRCUIT

Output Frequency = (Input Frequency)/2(N+1)

Where N = sum of values of programming diodes to limit of 15 for one 7493, 255 for two 7493's, and 4095 for three 7493's

CRYSTAL FREQUENCY

5760.000 KHz. $\pm$ 100 Hz.

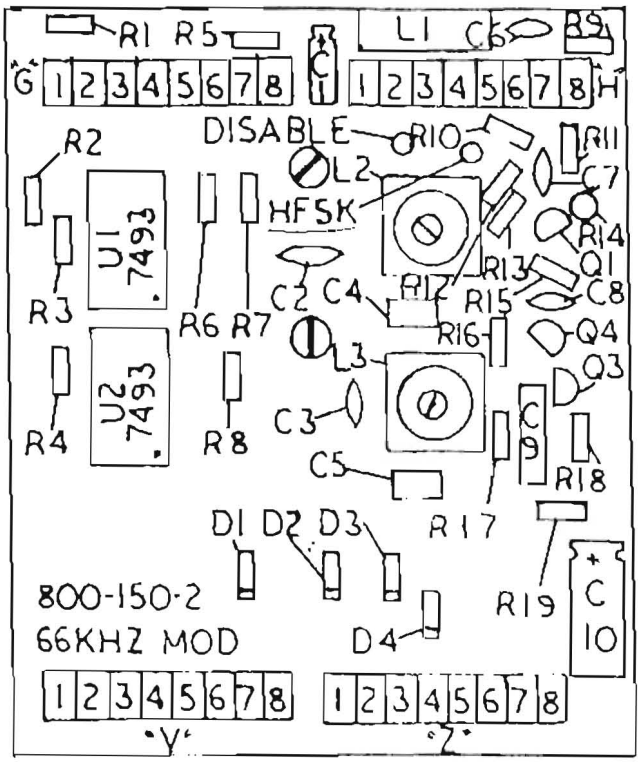
66 KHZ. DESCRIPTION

The 66 KHz. is used for Control with Type B or Type C RMC-15 Systems in which configuration the Control is sent as a subcarrier over an STL. The RMC-15, with the Mod Board in the Studio Unit, the RMC-15S, and the Demod Board in the Transmitter Unit, the RMC-15T, serves as its own subcarrier generator and receiver when used with single channel STL equipment. With dual STL's, the Control may be sent over either channel.

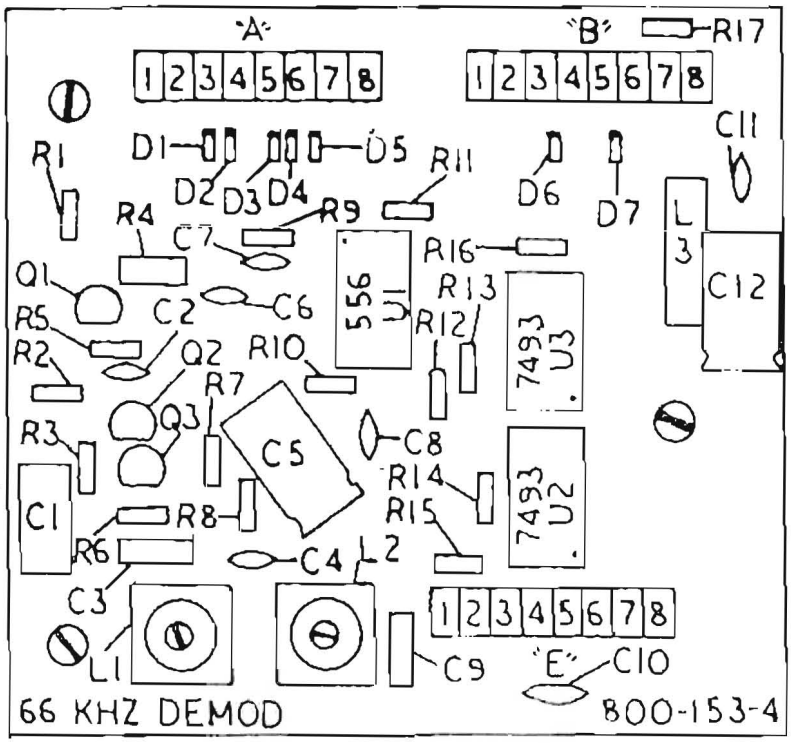
The output and input filters both rely on two stages of passive LC filtering, a darlington stage, and buffer to produce proper selectivity and gain. Adjustment of L2 and L3 of the Mod is for symmetry of output under load. The output may be disabled by grounding the terminal on the board indicated in the pictorial, "DISABLE". Grounding "HFSK" causes the output to be the higher of the FSK frequencies.

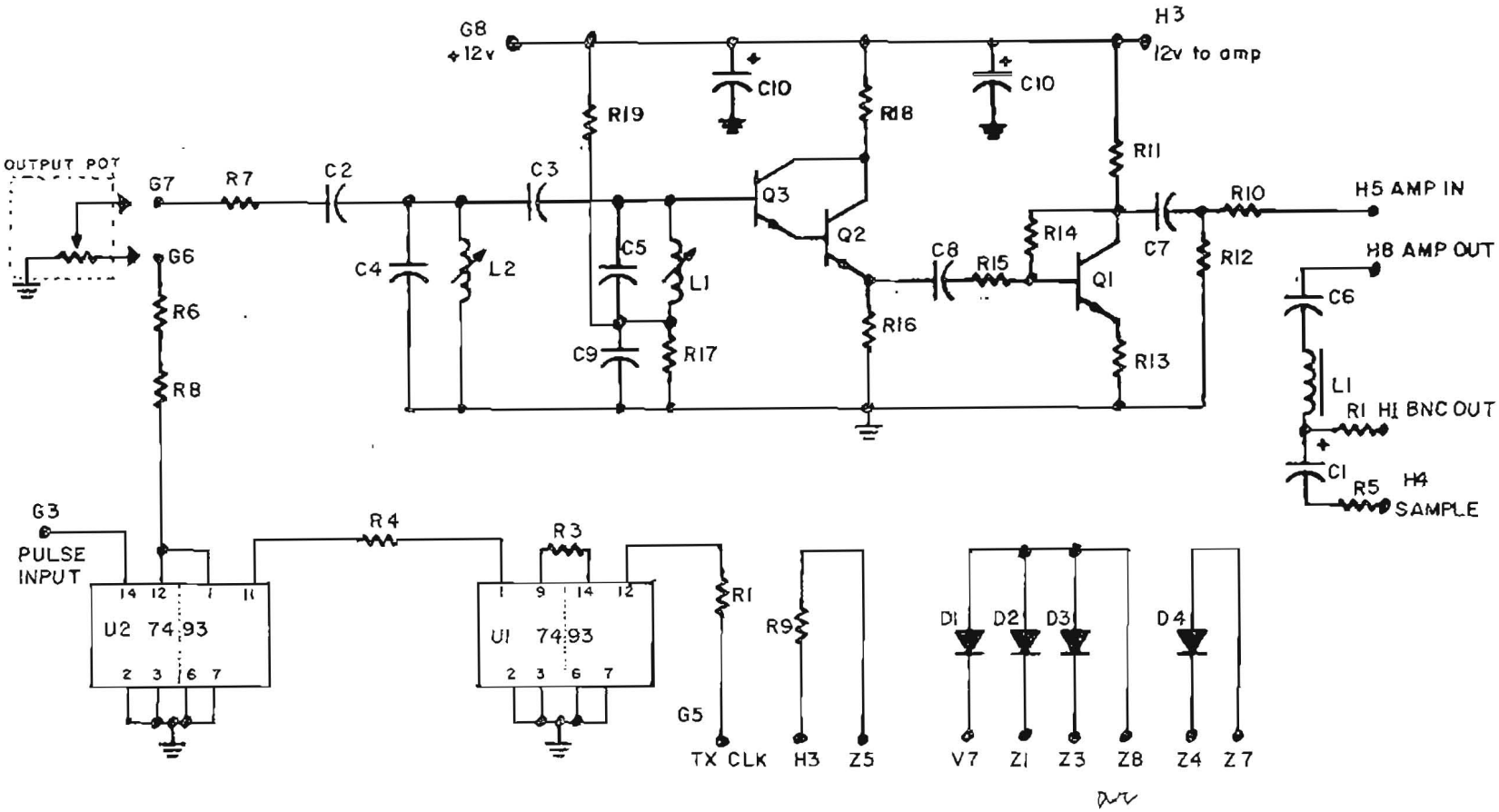
The Demod Board L1 and L2 are adjusted for maximum but symmetrical gain as measured at the Q1-R5 Junction.

The clock frequency is divided from the 66 KHz. by 32 on the respective boards. The 8 bit control word is sent about 8 times per second. The LED on the communications board in the transmitter unit should be flashing in a pattern at about 8 times per second when the unit is properly functioning.



66 KHZ FILTER BDS



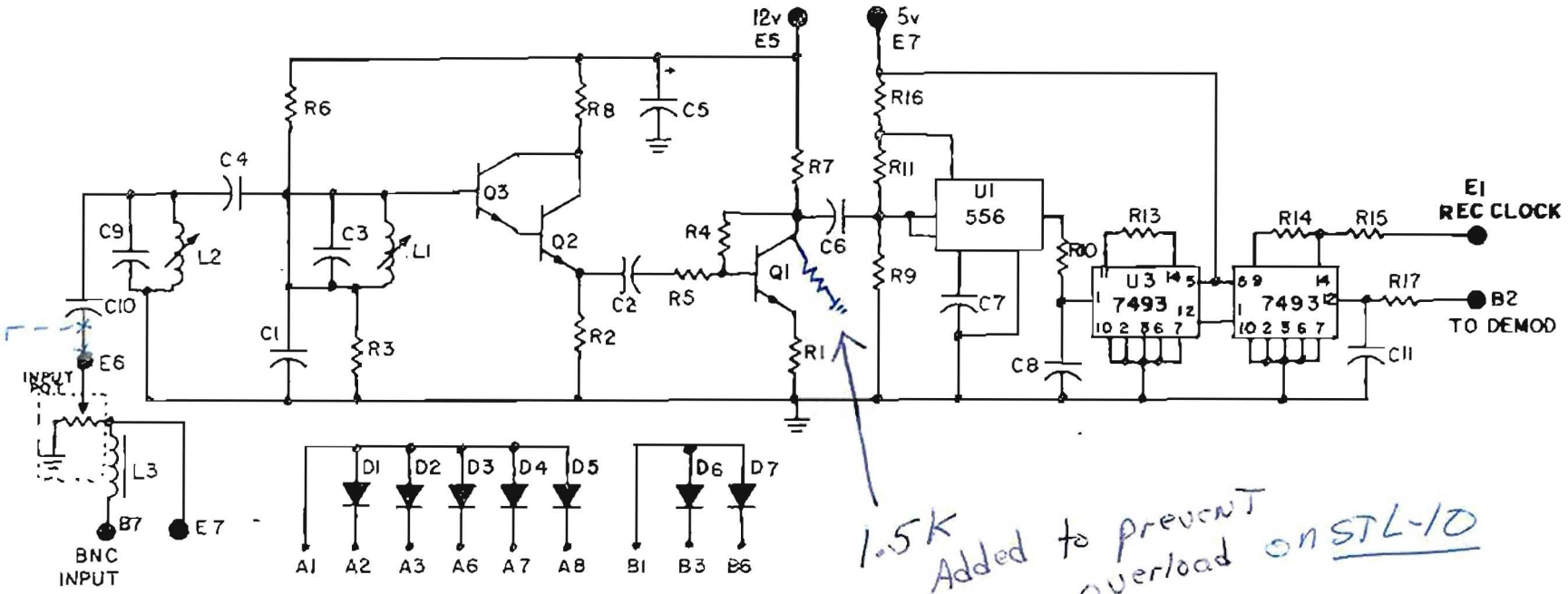


MARTI Electronics, Inc. PO BOX 661 CLEBURNE, TX 76031	DRAWING NO	REV.	DATE	APPROVED	USED ON	TITLE
	800-150-2		5-28-81		RMC 15	66KHZ MOD FILTER BOARD

910-004

PARTS LIST
RMC 15S
66 KHZ. MOD BOARD

REF.	MARTI P/N	DESCRIPTION
B1	800-150-2	PC Board, 66 KHz. Mod Board
C1	219-200	Capacitor, 22 uF 25V
C2	255-470-1	Capacitor, 47 pF 5% N330
C3	256-131	Capacitor, 130 pF Disc
C4,C5	215-202	Capacitor, 2000 pF polystyrene
C6	268-102	Capacitor, .001 uF Discap
C7,C8	217-104	Capacitor, .01 uF Discap
C9	226-104	Capacitor, .1 uF polycarbonate
C10	219-121	Capacitor, 150 uF 25V
D1-D4	410-914	Diode, Silicon 1N914/1N4148
L1	330-009	Choke, 5 mH
L2,L3	350-035	Coil, slug 3000 uH
Q1-Q3	425-301	Transistor, NPN 2N3904
R1	145-181	Resistor, 180 ohm 1/4 W
R2-R5	145-030	Resistor, 3.3 ohm 1/4 W
R6	145-470	Resistor, 47 ohm 1/4 W
R7	145-223	Resistor, 22K 1/4 W
R8,R9	145-030	Resistor, 3.3 ohm 1/4 W
R10	145-223	Resistor, 22 K 1/4 W
R11	145-561	Resistor, 560 ohm 1/4 W
R12	145-223	Resistor, 22 K 1/4 W
R13	145-030	Resistor, 3.3 ohm 1/4 W
R14	105-274	Resistor, 270K 1/2 W
R15	145-223	Resistor, 22 K 1/4 W
R16	145-103	Resistor, 10K 1/4 W
R17	145-102	Resistor, 1K 1/4 W
R18	145-470	Resistor, 47K 1/4 W
R19	145-102	Resistor, 1K 1/4 W
U1, U2	407-813	TTL IC, 7493



MARTI Electronics, Inc. PO BOX 661 CLEBURNE, TX 76031	DRAWING NO	REV.	DATE	APPROVED	USED ON	TITLE
	800-153-4		12-10-81		RMC-15	66 KHZ DEMOD FILTER BOARD

910-004

PARTS LIST
RMC 15T
66 KHZ. DEMOD BOARD

REF.	MARTI P/N	DESCRIPTION
B1	800-153-4	PC Board, 66 KHz. Demod Board
C1	226-274	Capacitor , 27 uF Polycarbonate
C2	217-104	Capacitor, .01 uF Discap
C3	215-202	Capacitor, 2000 pF Polystyrene
C4	256-131	Capacitor, 130 pF Disc
C5	219-251	Capacitor, 220 uF 25V
C6,C7	217-104	Capacitor, .01 uF Discap
C8	255-750	Capacitor, 75 pF Disc
C9	215-202	Capacitor, 2000 pF Polystyrene
C10	256-471	Capacitor, 470 pF 10% X5F
C11	217-104	Capacitor, .01 uF Discap
C12	219-251	Capacitor, 220 uF 25V
D1-D7	410-914	Diode, Silicon 1N914/1N4148
L1,L2	350-035	Coil, Slug 3000 uH
L3	330-009	Choke, 5 mH
Q1-Q4	425-301	Transistor, NPN 2N3904
R1	145-030	Resistor, 3.3 ohm 1/4 W
R2	145-103	Resistor, 10K 1/4 W
R3	145-102	Resistor, 1K 1/4 W
R4	105-274	Resistor, 270K 1/2 W
R5	145-472	Resistor, 4.7K 1/2 W
R6	145-102	Resistor, 1K 1/4 W
R7	145-272	Resistor, 2.7K 1/4 W
R8	145-470	Resistor, 47 ohm 1/4 W
R9,R10	145-104	Resistor, 100K, 1/4 W
R11-R15	145-030	Resistor, 3.3 ohm 1/4 W
U1	407-556	Linear IC, LM556
U2,U3	407-813	TTL IC, 7493

2400 HZ. DESCRIPTION

The 2400 Hz. is used for Control in Type A Systems and Telemetry in Type B Systems. In Type A Systems, commonly used with a bidirectional telephone line, the Mod Board is in the Studio Unit, RMC 15S, and the Demod Board is in the Transmitter Unit, RMC 15T. In Type B Systems, the Mod Board is in the Transmitter Unit and the Demod Board is in the Studio Unit.

The output filter converts the square TTL FSK signal into sine waves prior to amplification. The output may be disabled by grounding the terminal on the Mod Board, "Disable," while grounding the "HFSK" causes the output to be the higher of the FSK frequencies.

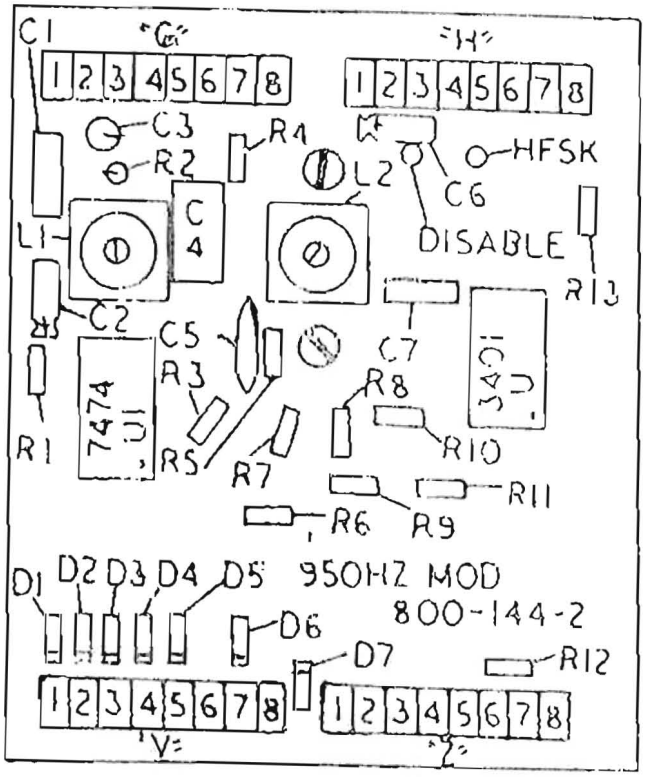
The demod circuit includes two stages of passive LC filtering, an active filter, gain stages and a tracking filter prior to FSK detection.

The clock frequency is synchronous with the output and is one-half of that frequency. The Type A control rate is about 5 times per second and the telemetry rate in Type B is about twice a second.

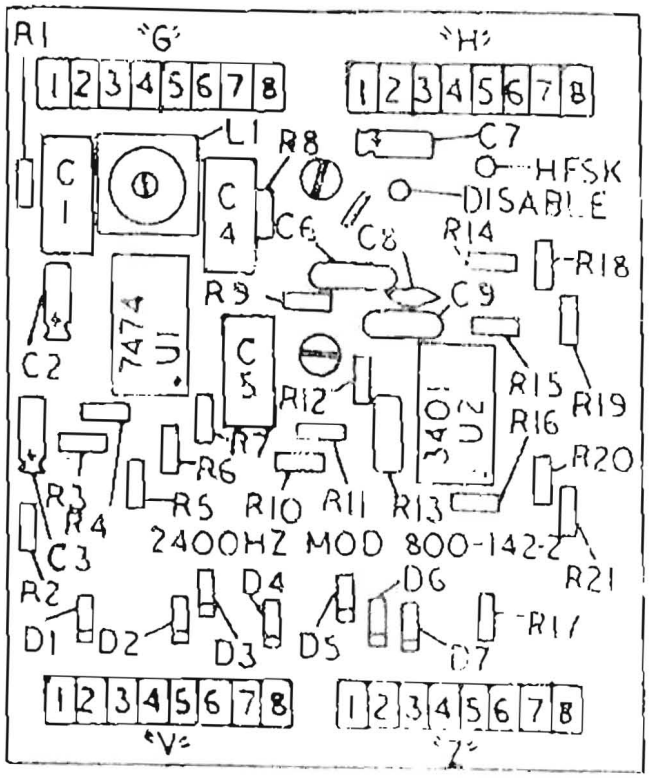
950 HZ. DESCRIPTION

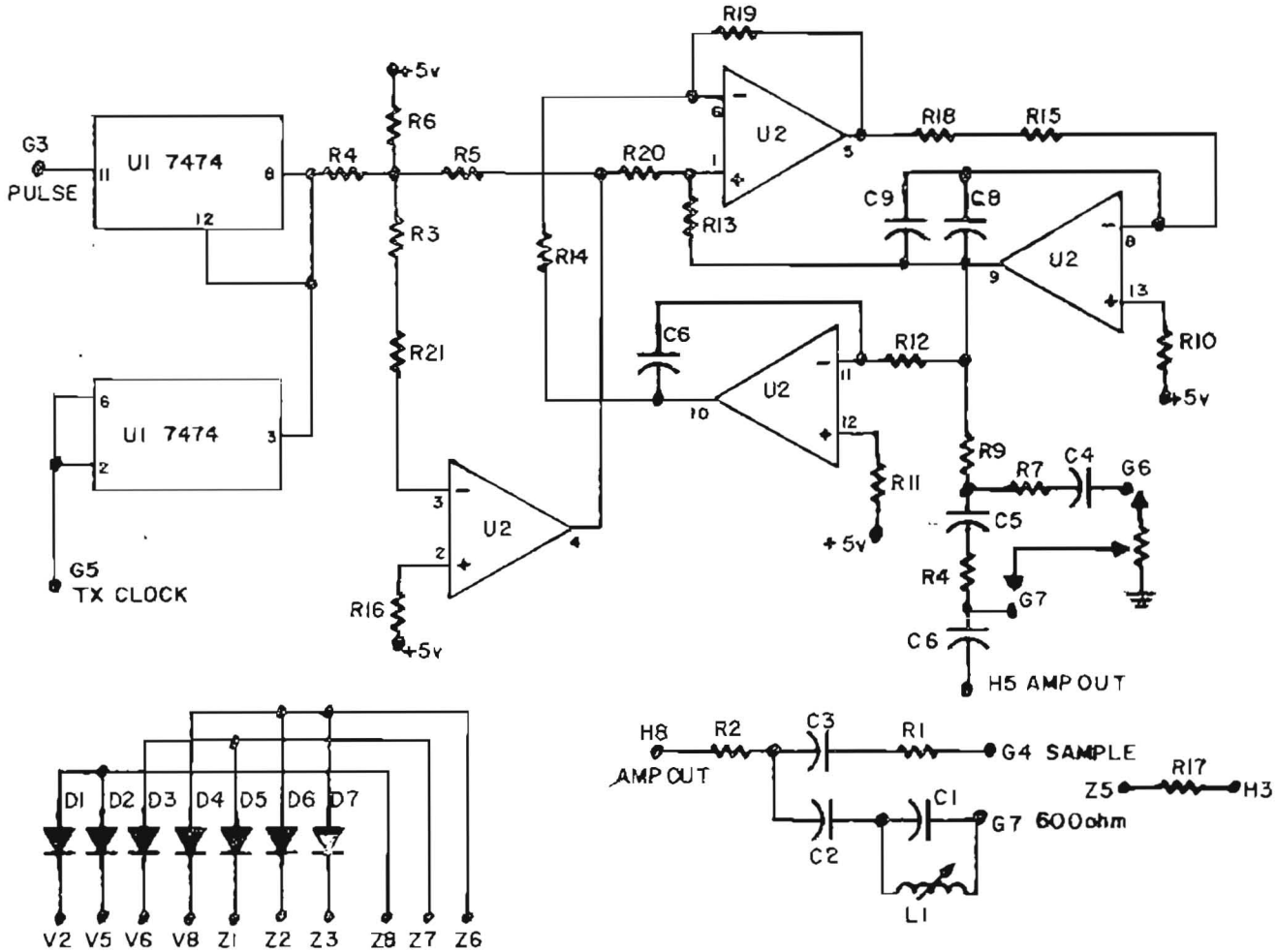
The 950 Hz. is used in Type A Systems for Telemetry in conjunction with 2400 Hz. for Control. The 950 Hz. Mod Board is used in the Transmitter Unit, RMC 15T, and Demod Board is in the Studio Unit, RMC 15S.

The Mod and Demod functions identically to the 2400 Hz. above. The telemetry rate for Type A Systems is about once a second.



950/2400 HZ MOD FILTER BDS





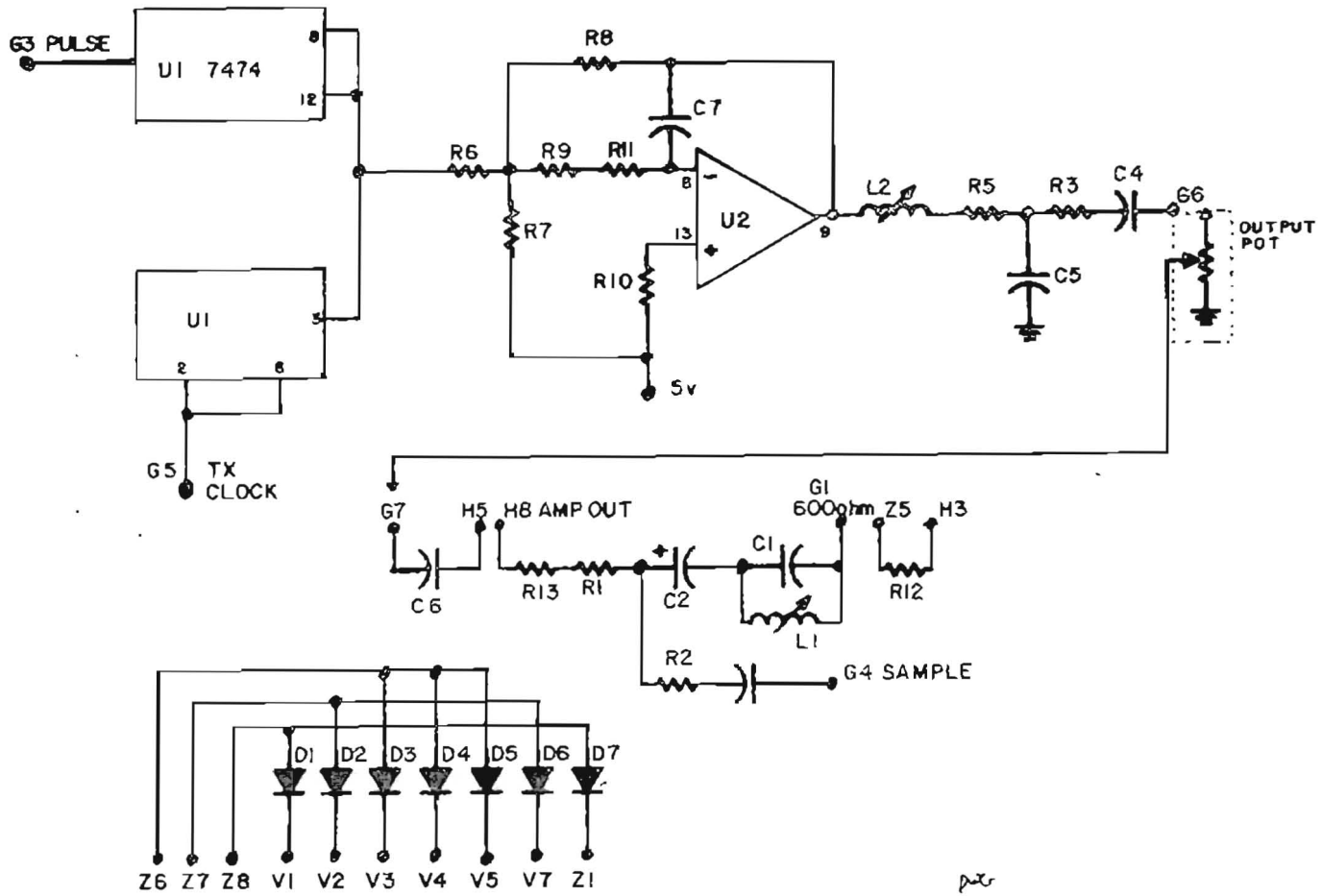
DWG

MARTI Electronics, Inc. PO BOX 661 CLEBURNE, TX 76031	DRAWING NO	REV.	DATE	APPROVED	USED ON	TITLE
	800-142-2		6-10-81		RMC 15	2400HZ MOD FILTER BOARD

910-004

PARTS LIST
RMC 15S/T
2400 HZ. MOD BOARD

REF.	MARTI P/N	DESCRIPTION
B1	800-142-2	PC Board, 2400 Mod Board
C1A	226-104	Capacitor, .1 uF polycarbonate
C1B	226-274	Capacitor, .27 uF polycarbonate
C2,C3	219-200	Capacitor, 22 uF 25V
C4,C5	226-274	Capacitor, .27 uF polycarbonate
C6	255-161	Capacitor, 160 pF mica
C7	219-200	Capacitor, 22 uF 25V
C8	255-100	Capacitor, 10 pF disc
C9	255-274	Capacitor, 160 pF mica
D1-D7	410-914	Diode, Silicon 1N914/1N4148
L1	350-027	Coil, Slug 60 mH
R1	145-102	Resistor, 1K 1/4 W
R2	145-470	Resistor, 47 ohm 1/4 W
R3,R4	145-184	Resistor, 180K 1/4 W
R5	145-474	Resistor, 470K 1/4 W
R6	145-105	Resistor, 1 Meg 1/4 W
R7	145-452	Resistor, 4.7K 1/4 W
R8	145-562	Resistor, 5.6K 1/4 W
R9	145-102	Resistor, 1K 1/4 W
R10,R11	145-105	Resistor, 1 Meg 1/4 W
R12	145-104	Resistor, 100K 1/4 W
R13	105-156	Resistor, 15 Meg 1/2 W
R14	145-184	Resistor, 180K 1/4 W
R15	145-104	Resistor, 100K 1/4 W
R16	145-105	Resistor, 1 Meg 1/4 W
R17	145-030	Resistor, 3.3 ohm 1/4 W
R18	145-184	Resistor, 180K 1/4 W
R19-R21	145-104	Resistor, 100K 1/4 W
U1	407-474	TTL IC, 7474
U2	403-900	Linear IC, LM3900/MC3401

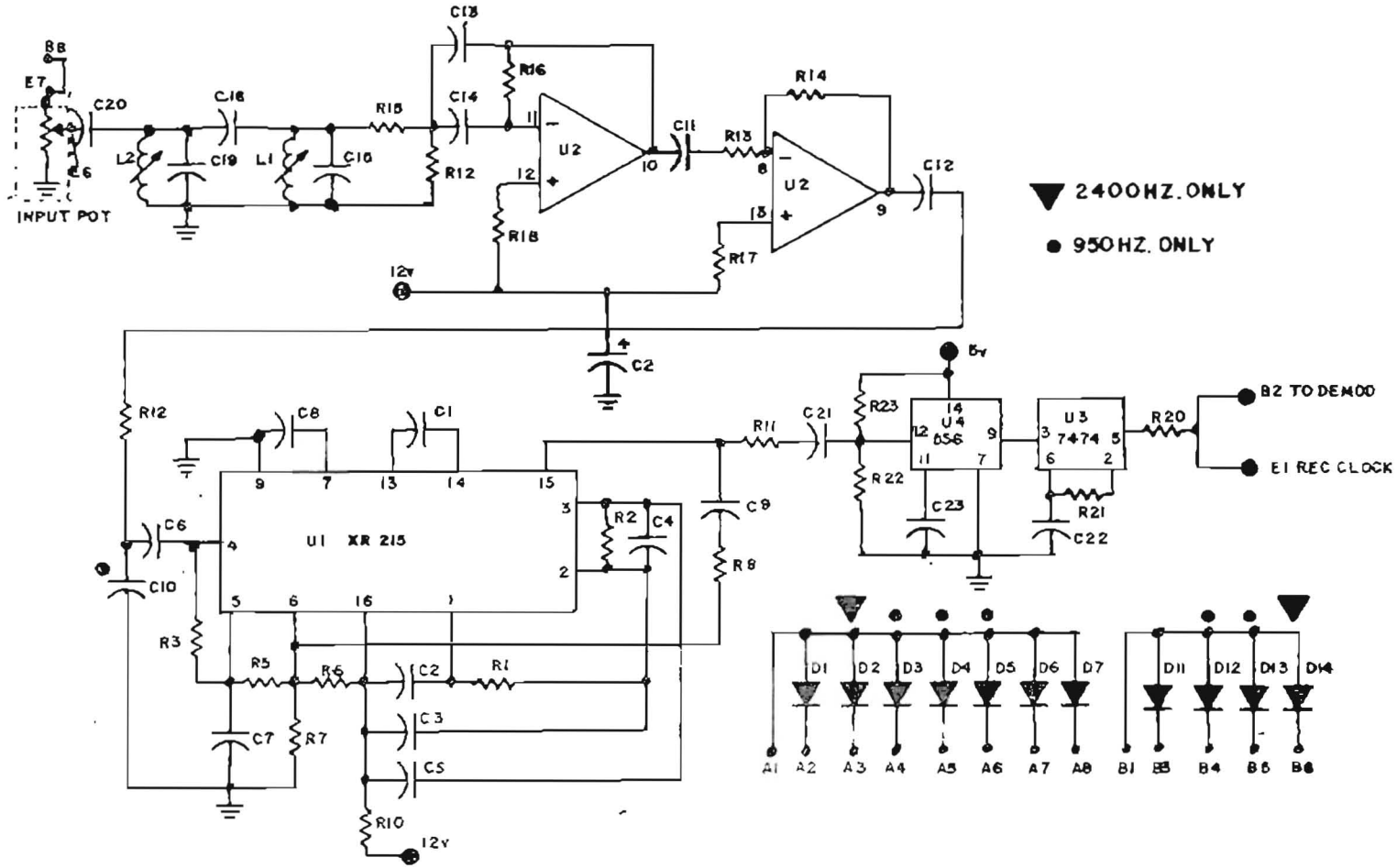


MARTI Electronics, Inc. PO BOX 661 CLEBURNE, TX 76031	DRAWING NO	REV.	DATE	APPROVED	USED ON	TITLE
	800-144-2		6-10-81		RMC 15	950HZ MOD FILTER BOARD

910-004

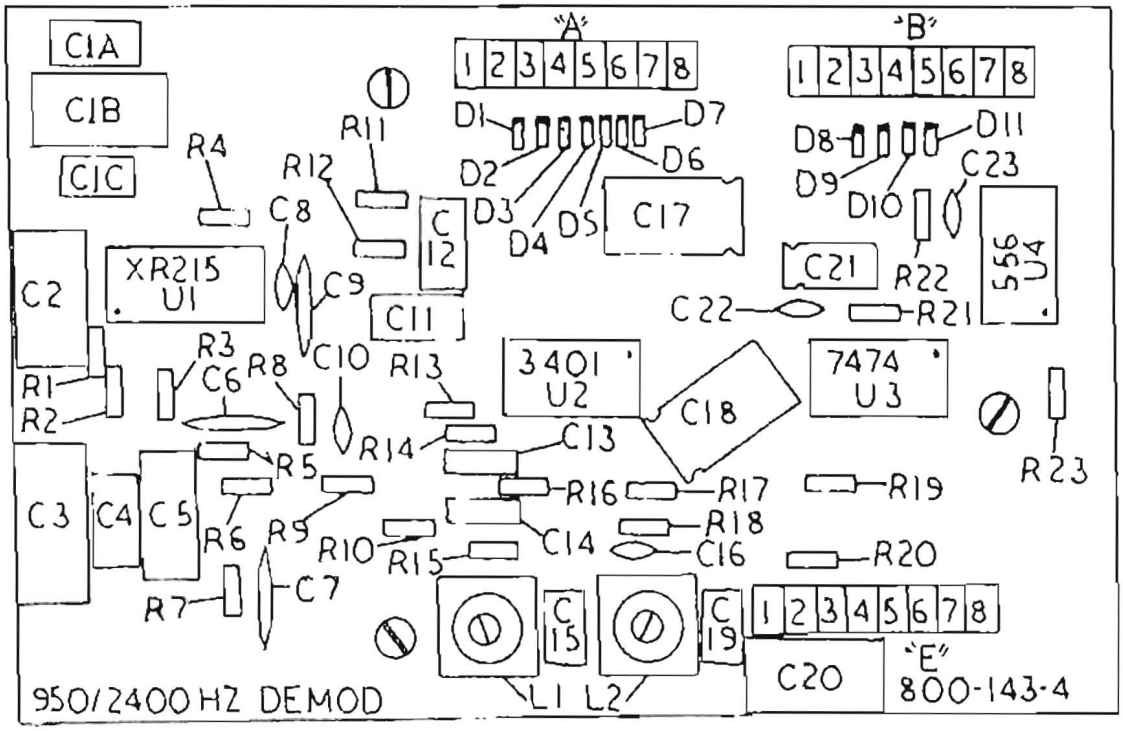
PARTS LIST
RMC 15T
950 HZ. MOD BOARD

REF.	MARTI P/N	DESCRIPTION
B1	800-144-2	PC Board, 950 Mod Board
C1	226-104	Capacitor, .1 uF polycarbonate
C2,C3	219-200	Capacitor, 22 uF 25V
C4	226-274	Capacitor, .27 uF polycarbonate
C5	217-103	Capacitor, .1 uF Disc 25V
C6	219-200	Capacitor, 22 uF 25V
C7	215-122	Capacitor, 1200 pF polystyrene
D1-D7	410-914	Diode, Silicon 1N914/1N4148
L1	350-027	Coil, Slug 60 mH
L2	300-002	Coil, Slug 230 mH
R1	145-470	Resistor, 47 ohm 1/4 W
R2	145-681	Resistor, 680 ohm 1/4 W
R3	145-103	Resistor, 10K 1/4 W
R4	145-562	Resistor, 5.6K 1/4 W
R5	145-102	Resistor, 1K 1/4 W
R6	145-473	Resistor, 47K 1/4 W
R7	145-105	Resistor, 1 meg 1/4 W
R8	145-474	Resistor, 470K 1/4 W
R9	145-104	Resistor, 100K 1/4 W
R10	145-105	Resistor, 1 meg 1/4 W
R11	145-184	Resistor, 180K 1/4 W
R12,R13	145-030	Resistor, 3.3 ohm 1/4 W
U1	407-474	TTL IC, 7474
U2	403-900	Linear IC, LM3900/MC3401



MARTI Electronics, Inc. PO BOX 661 CLEBURNE, TX 76031	DRAWING NO	REV.	DATE	APPROVED	USED ON	TITLE
	800-143-4		12-10-81		RMC-15	2400HZ/950HZ DEMOD FILTER BOARD

910-004



950/2400 HZ DEMOD FILTER BD

PARTS LIST
RMC 15S/T
2400/950 HZ. DEMOD BOARD

REF.	MARTI P/N	DESCRIPTION
B1	800-143-4	PC Board 2400/950 DEMOD BOARD
C1A(2400)	215-473	Capacitor, 47,000 pF Polystyrene
C1A(950)	215-223	Capacitor, 22,000 pF Polystyrene
C1B(2400)	215-223	Capacitor, 22,000 pF Polystyrene
C1B(950)	215-153	Capacitor, 15,000 pF Polystyrene
C1C(2400)	226-224	Capacitor, .22 uF Polycarbonate
C2,C3(2400)	215-333	Capacitor, 33,000 pF Polystyrene
C2(950)	215-473	Capacitor, 47,000 pF Polystyrene
C3(950)	226-010	Capacitor, 1 uF Polycarbonate
C4(2400)	226-274	Capacitor, .27 uF Polycarbonate
C4(950)	226-224	Capacitor, .22 uF Polycarbonate
C5	215-333	Capacitor, 33,000 Polycarbonate
C6,C7	217-103	Capacitor, .1 uF Disc 25V
C8	256-301	Capacitor, 300 pF Disc 25V
C9	217-103	Capacitor, .1 uF Disc
C10(950 only)	256-301	Capacitor, 300 pF Disc
C11,C12(2400)	217-103	Capacitor, .1 uF Disc 25V
C11,C12(950)	226-274	Capacitor, .27 uF Polycarbonate
C13,C14(2400)	215-701	Capacitor, 700 pF Polystyrene
C13,C14(950)	215-122	Capacitor, 1200 pF Polystyrene
C15(2400)	215-153	Capacitor, 15,000 pF Polystyrene
C15(950)	226-103	Capacitor, .1 uF Polycarbonate
C16	268-102	Capacitor, .001 uF Discap
C17,C18	219-251	Capacitor, 220 uF 25V
C19(2400)	215-153	Capacitor, 15,000 pF Polystyrene
C19(950)	226-104	Capacitor, .1 uF Polycarbonate
C20(2400)	215-622	Capacitor, 6200 uF Polystyrene
C20(950)	215-473	Capacitor, 47,000 Polystyrene
C21	219-200	Capacitor, 22 uF 25V
C22,C23	217-104	Capacitor, .01 uF Disc
D1-D9	410-914	Diode, Silicon 1N915/1N4148
L1,L2	350-035	Coil slug 3000 uH

PARTS LIST
RMC 15S/T
2400/950 HZ. DEMOD BOARD

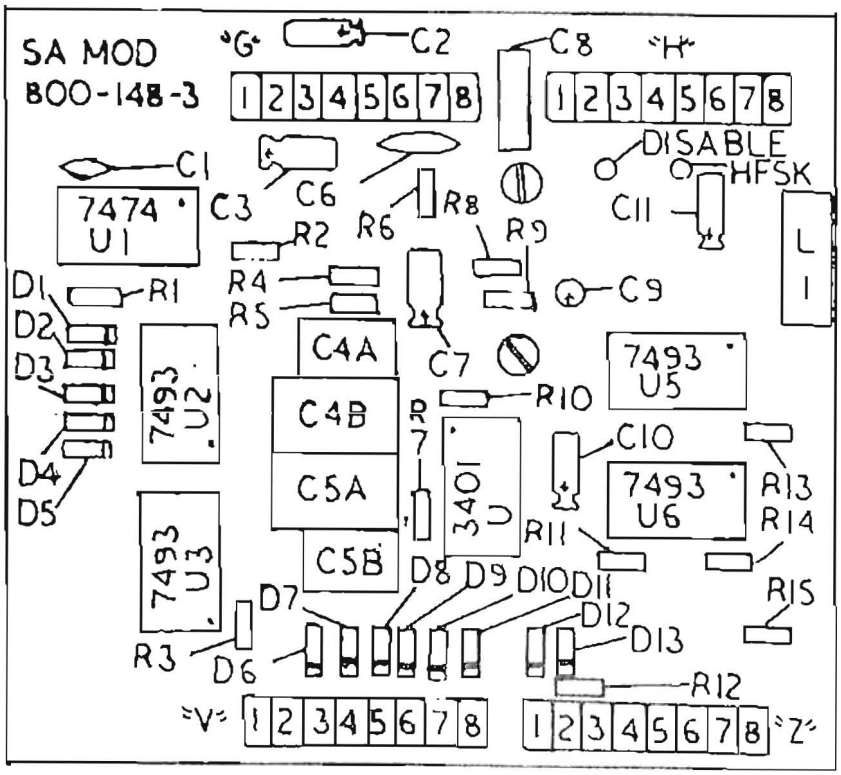
REF.	MARTI P/N	DESCRIPTION
R1,R2	145-103	Resistor, 10K 1/4 W
R3-R5	145-222	Resistor, 2.2K 1/4 W
R6,R7	145-472	Resistor, 4.7K 1/4 W
R8	145-222	Resistor, 2.2K 1/4 W
R9	145-030	Resistor, 3.3 ohm 1/4 W
R10(2400)	145-822	Resistor, 8.2K 1/4 W
R10(950)	145-183	Resistor, 18K 1/4 W
R11	145-472	Resistor, 4.7K 1/4 W
R12(2400)	145-105	Resistor, 1 Meg 1/4 W
R12(950)	145-123	Resistor, 12K 1/4 W
R13	145-103	Resistor, 10K 1/4 W
R14	145-105	Resistor, 1 Meg 1/4 W
R15	145-104	Resistor, 100K 1/4 W
R16	145-105	Resistor, 1 Meg 1/4 W
R17,R18	145-225	Resistor, 2.2 Meg 1/4 W
R19-R21	145-030	Resistor, 3.3 ohm 1/4 W
R22,R23	145-104	Resistor, 100K 1/4 W
U1	400-215	PLL,IC XR215
U2	403-900	Linear IC, LM3900/MC3401
U3	400-556	Linear IC, LM556

SUBAUDIBLE DESCRIPTION

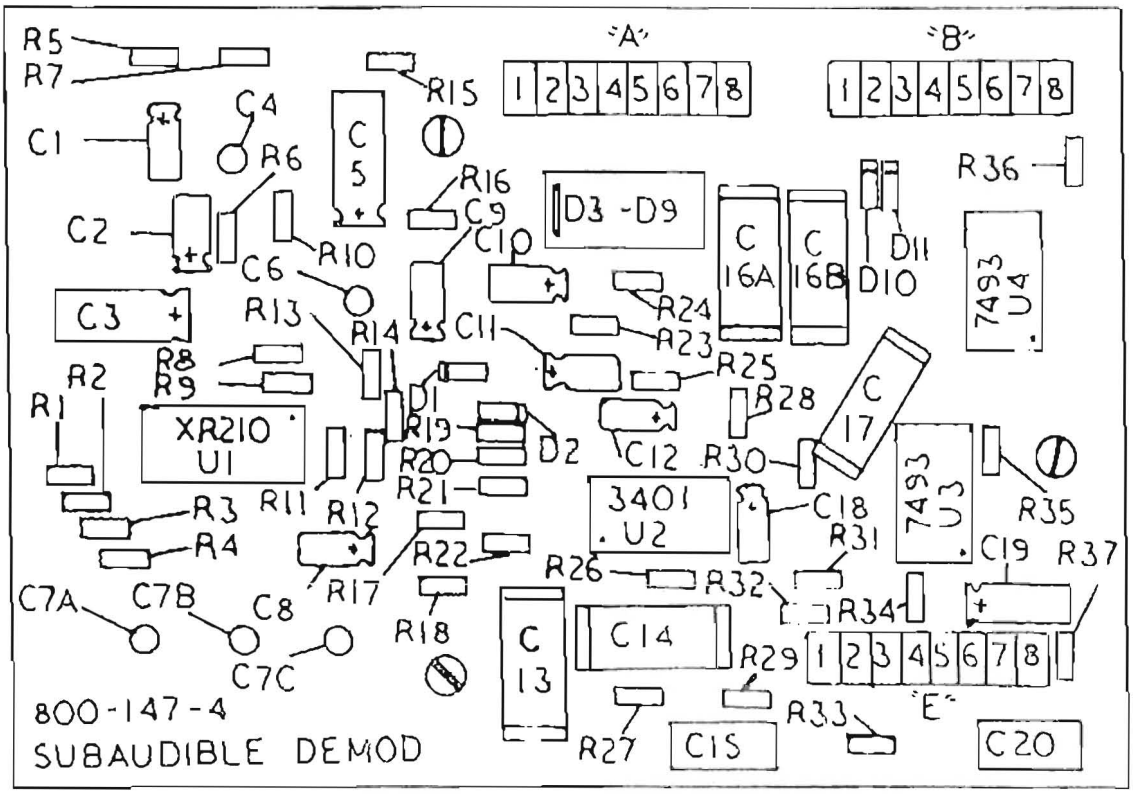
Subaudible telemetry is used with Type C Systems. The Mod Board is in the Transmitter Unit, RMC 15T. The Demod Board is in the Studio Unit, RMC 15S. The subaudible telemetry may be transmitted from the main broadcast transmitter by being injected either into the AM audio before the modulator, or the FM SCA audio, or it may be relayed with a TSL, or, in some cases, be sent from the transmitter site to the studio site over DC telephone lines.

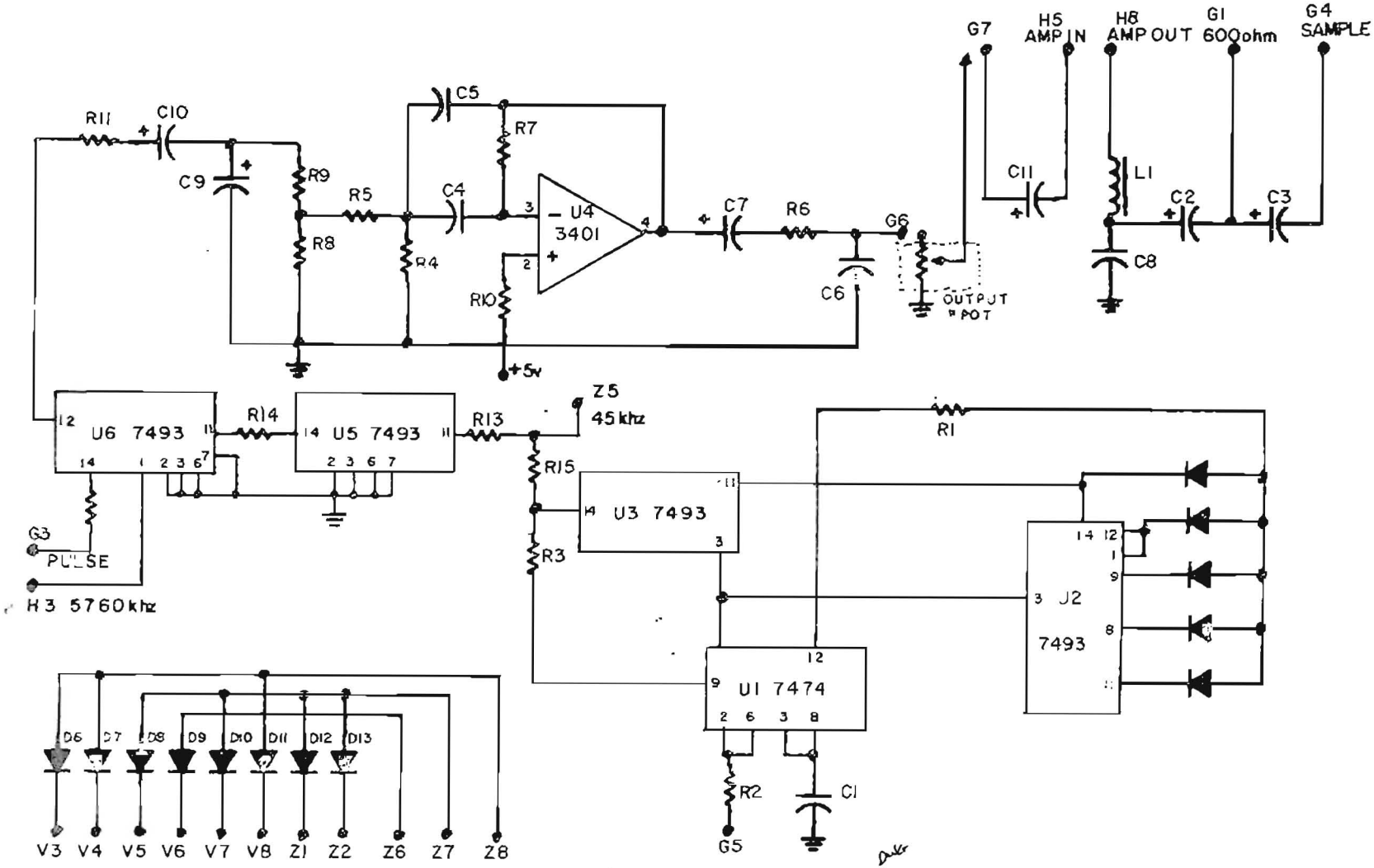
Three circuits are specifically tuned to 25 Hz.: the Mod passband filter, the Demod passband filter, and the Demod XR210 free-running frequency The tuning is accomplished by the addition of capacitors as needed in these circuits.

A special fixed clock circuit is used with the subaudible telemetry UART conversions. The clock circuit is located on the Mod Board and under the Demod Board on the substrate. The frequency is diode selected to be either 90 or 100 Hz.



SUBAUDIBLE FILTER BDS



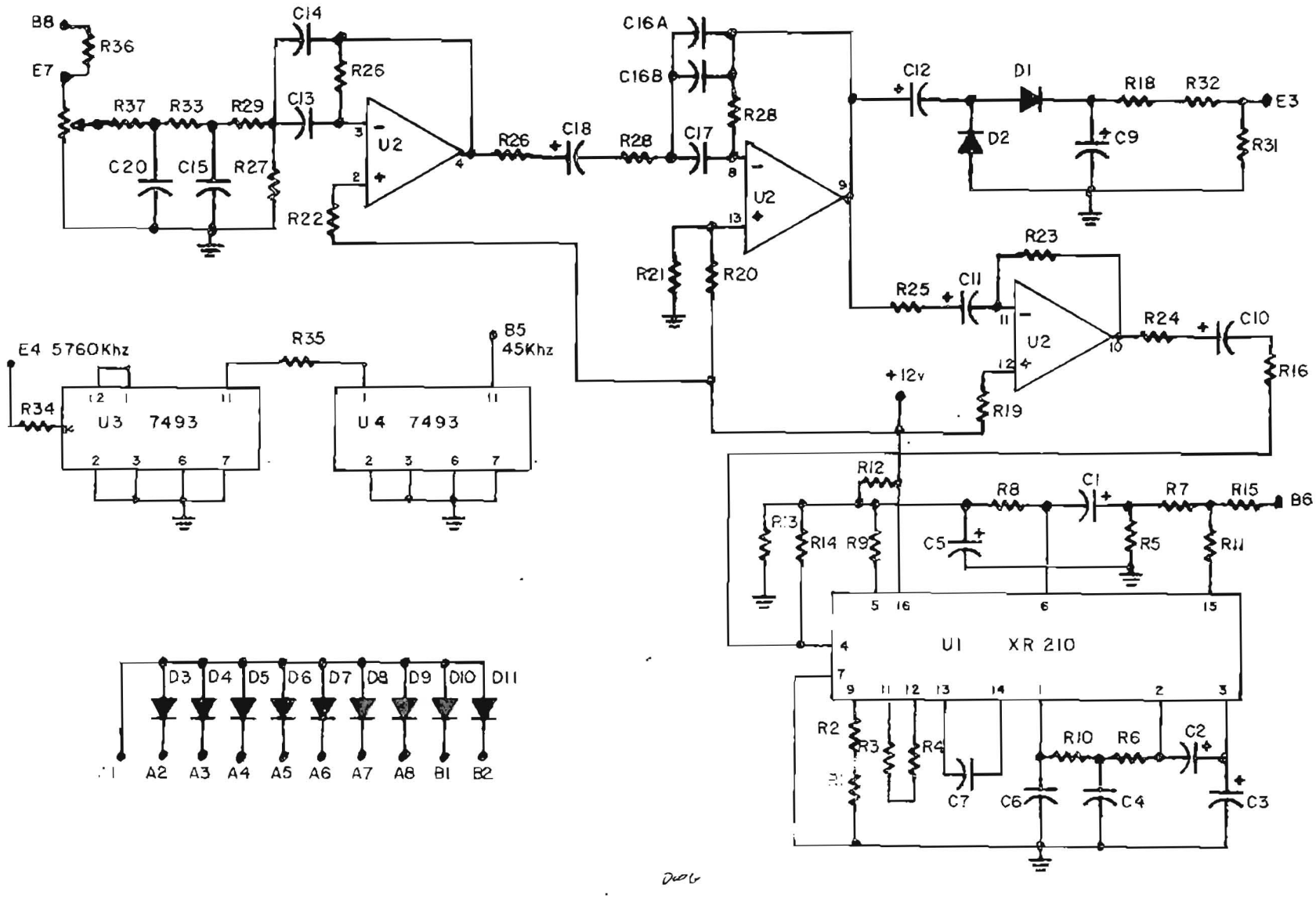


MARTI Electronics, Inc. PO BOX 661 CLEBURNE, TX 76031	DRAWING NO 800-148-3	REV.	DATE 6-4-81	APPROVED	USED ON RMC-15	TITLE SUBAUDIBLE MOD FILTER BOARD

910-004

PARTS LIST
RMC 15T
SUBAUDIBLE MOD BOARD

REF.	MARTI P/N	DESCRIPTION
B1	800-148-3	PC Board, Subaudible Mod Board
C1	268-102	Capacitor, .001 uF Discap
C2	219-200	Capacitor, 22 uF 25V
C3	219-080	Capacitor, 10 uF 63V
C4A	215-223	Capacitor, 22,000 pF polystyrene
C4B	215-473	Capacitor, 47,000 pF polystyrene
C5A	215-473	Capacitor, 47,000 pF polystyrene
C5B	215-223	Capacitor, 22,000 pF polystyrene
C6	217-104	Capacitor, .1 uF Disc 25V
C7	219-080	Capacitor, 10 uF 63V
C8	226-104	Capacitor, .1 uF polycarbonate
C9	299-470	Capacitor, 4.7 uF 16V
C10,C11	219-200	Capacitor, 22 uF 25V
D1-D13	410-914	Diode, Silicon 1N914/1N4148
L1	330-009	Choke, 5 mH
R1-R3	145-030	Resistor, 3.3 ohm 1/4 W
R4	145-183	Resistor, 18K 1/4 W
R5	145-822	Resistor, 8.2K 1/4 W
R6	145-123	Resistor, 12K 1/4 W
R7	145-105	Resistor, 1 meg 1/4 W
R8,R9	145-472	Resistor, 4.7K 1/4 W
R10	145-222	Resistor, 2.2K 1/4 W
R11-R15	145-030	Resistor, 3.3 ohm 1/4 W
U1	407-474	TTL IC, 7474
U2,U3	407-813	TTL IC, 7493
U4	403-900	Linear IC, LM3900/MC3401
U5,U6	407-813	TTL IC, 7493



MARTI Electronics, Inc. PO BOX 661 CLEBURNE, TX 76031	DRAWING NO	REV.	DATE	APPROVED	USED ON	TITLE
	800-147-4		6-5-81		RMC 15	SUBAUDIBLE DEMOD FILTER

910-004

PARTS LIST
RMC 15S
SUBAUDIBLE DEMOD BOARD

REF.	MARTI P/N	DESCRIPTION
B1	800-147-4	PC Board, Subaudible Demod Board
C1,C2	219-080	Capacitor, 10 uF 63V
C3	219-121	Capacitor, 150 uF 25V
C4	299-150	Capacitor, 1.5 uF Tantalum 35V
C5	219-121	Capacitor, 150 uF 25V
C6	299-150	Capacitor, 1.5 uF Tantalum 35V
C7A,C7B	299-150	Capacitor, 1.5 uF Tantalum 35V
C7C	299-470	Capacitor, 4.7 uF Tantalum 16V
C8-C12	219-200	Capacitor, 22 uF 25V
C13,C14	215-473	Capacitor, 47,000 pF polystyrene
C15	226-274	Capacitor, .27 uF polycarbonate
C16A,C16B	215-473	Capacitor, 47,000 pF polystyrene
C17	215-473	Capacitor, 47,000 pF polystyrene
C18,C19	219-200	Capacitor, 22 uF 25V
C20	226-274	Capacitor, .27 uF polycarbonate
D1-D11	410-914	Diode, Silicon 1N914/1N4148
R1	145-102	Resistor, 1K 1/4 W
R2	145-562	Resistor, 5.6K 1/4 W
R3	145-030	Resistor, 3.3 ohm 1/4 W
R4	145-562	Resistor, 5.6K 1/4 W
R5,R6	145-103	Resistor, 10K 1/4 W
R7	145-223	Resistor, 22K 1/4 W
R8	145-392	Resistor, 3.9K 1/4 W
R9	145-222	Resistor, 2.2K 1/4 W
R10	145-472	Resistor, 4.7K 1/4 W
R11	145-030	Resistor, 3.3 ohm 1/4 W
R12,R13	145-472	Resistor, 4.7K 1/4 W
R14	145-392	Resistor, 3.9K 1/4 W
R15-R18	145-030	Resistor, 3.3 ohm 1/4 W
R19,R20	145-225	Resistor, 2.2 meg 1/4 W
R21	145-474	Resistor, 470K 1/4 W
R22	145-225	Resistor, 2.2 meg 1/4 W
R23	145-105	Resistor, 1 meg 1/4 W
R24	145-223	Resistor, 22K 1/4 W
R25	145-474	Resistor, 470K 1/4 W
R26	145-105	Resistor, 1 meg 1/4 W
R27	145-183	Resistor, 18K 1/4 W
R28	145-105	Resistor, 1 meg 1/4 W
R29	145-104	Resistor, 100K 1/4 W
R30	145-103	Resistor, 10K 1/4 W
R31,R32	145-333	Resistor, 33K 1/4 W
R33	145-103	Resistor, 10K 1/4 W
R34-R36	145-030	Resistor, 3.3 ohm 1/4 W
R37	145-103	Resistor, 10K 1/4 W
U1	400-210	PLL IC, XR210
U2	403-900	Linear IC, LM3900/MC3401
U3,U4	407-813	TTL IC, 7493

RMC 30 DESCRIPTION

When the RMC-30S is used with the RMC-15S and the RY-30 is added to the RMC-15T and RY-15, the fifteen channel system is increased to thirty full function channels.

Channels 16 to 30 are similar in function to Channels Zero to 15 except that the telemetry is not normally turned off for channel 16 as is in Channel Zero.

The channel "AUX" is reserved for custom requirements and future applications of the RMC-15/30 System.

INSTALLATION

The RMC-30S should be mounted either directly above or under the RMC-15S. With the connection of both units to the cable provided, the functions are automatically adjusted to the new configuration. For ease of operation in the local mode, the RY-30 should be mounted either directly above or below the RMC-15T, with the RY-15 mounted on the opposite side. With this arrangement, the RMC-15T in the middle, one hand can operate a channel select button and a raise/lower function while leaving the other hand free to calibrate the reading. Since P1 and P2 on the rear of the RMC-15T are wired in parallel, the cables going to the RY-15 and the RY-30 may be connected to either of these.

The user defined connections for Channels 16 to 30 are analogous to those for Channels Zero to 15. Channel 16 connections are made through the terminal strip as was Channel Zero. The RY-15 and RY-30 have each both raise and lower relays. Enabling them on the RY-30 involves connection of pins 16 to terminal 6 as was done in the RY-15.

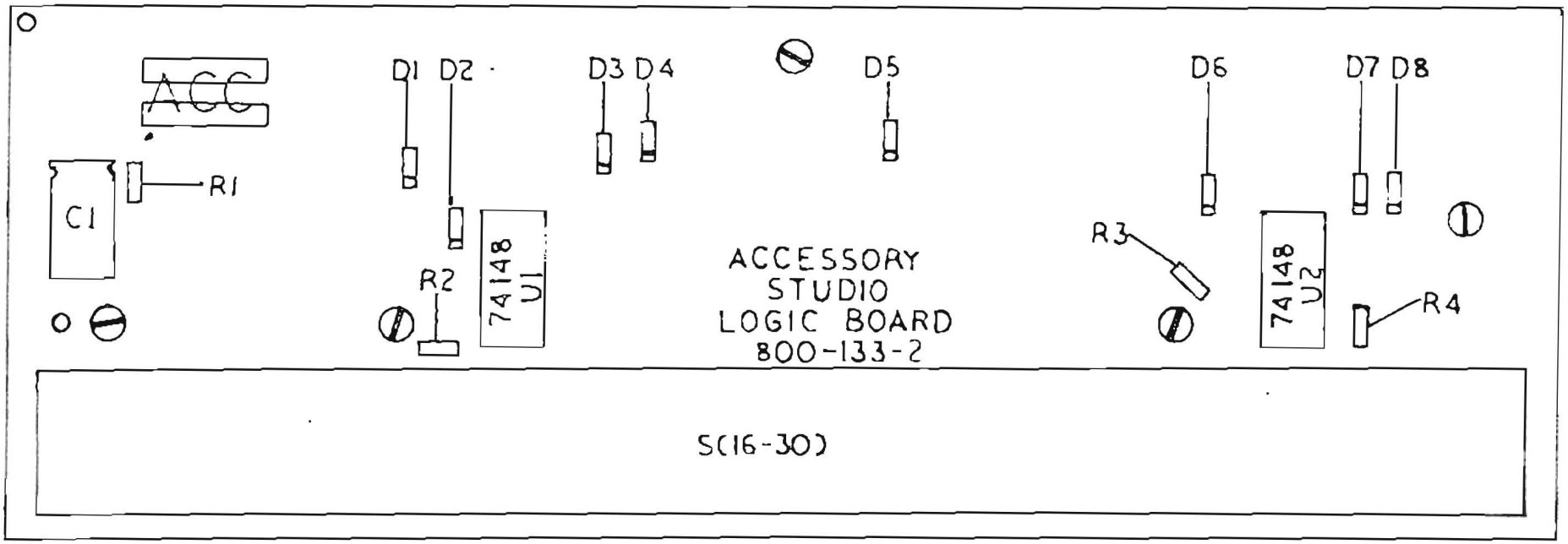
OPERATION

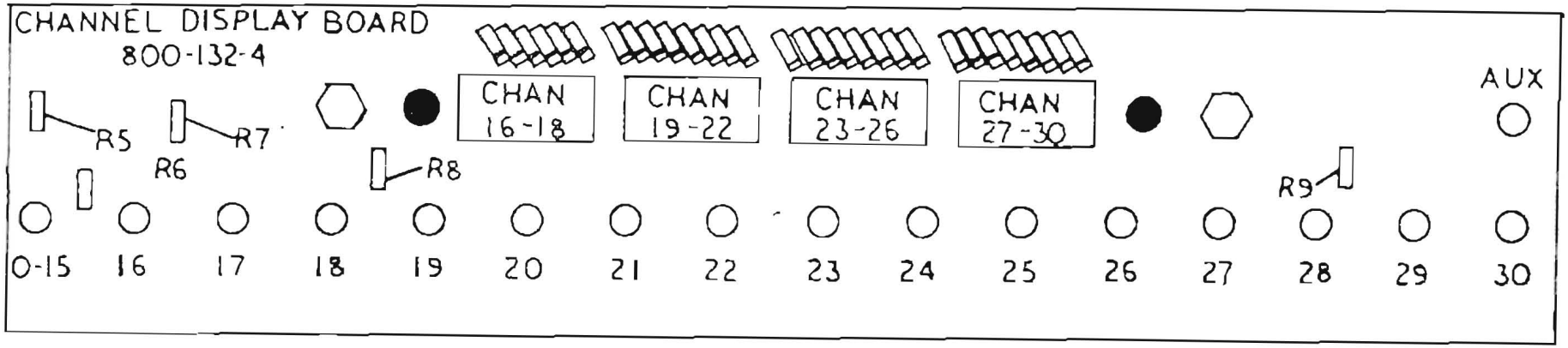
The addition of the RMC-30S and RY-30 modify slightly the operation of the 15 channel system. In Control, Channels 16 to 30 take priority over Channels Zero to 15. In order to select any of the Channels Zero to 15, the unnumbered button on the left end of the switch bank of the RMC-30S must be selected. If no button is depressed on the RMC-30S, Channel Zero is selected at the transmitter site.

No external button is provided on the Studio Unit for the "AUX" Channel for it is intended to be selected by custom circuitry installed within the RMC-30S chassis. When the internal terminal is grounded, the channel is selected over all others and the channel selection indicator labeled "AUX" is turned on. "AUX" selection disables the Raise and Lower switches on the RMC-15S. These functions may be effected through internal circuitry added to the RMC-30S. For theChannel "AUX" a corresponding relay is found in the RY-30 and is accessed under Local Control as are the other channels.

RY-30 PICTORIALS,SCHEMATIC, AND PARTS LIST

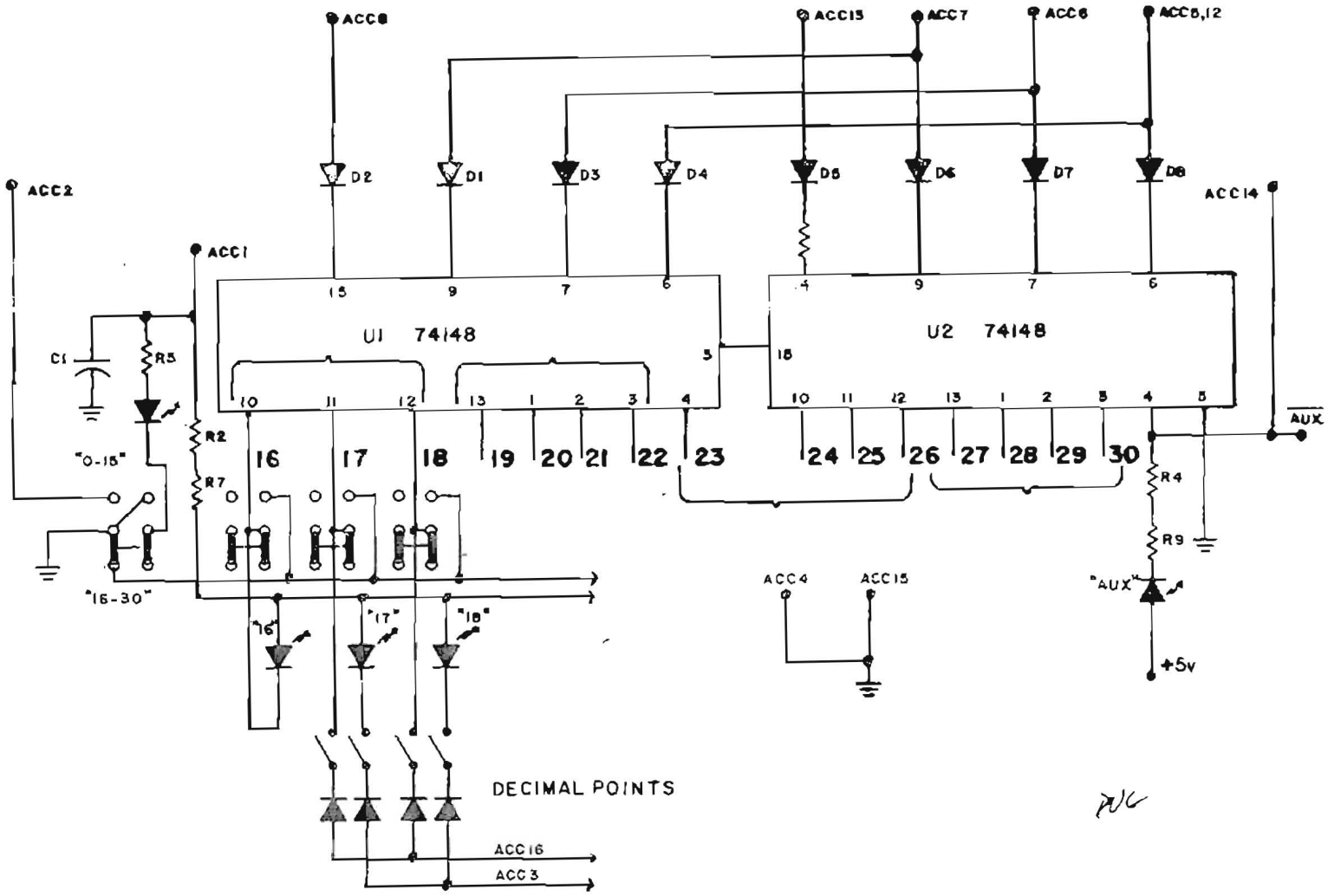
These are essentially the same as the RY-15 except for a few wire jumpers used in programming the boards. Refer to the documentation on the RY-15 as needed for the RY-30. The necessary information for the RMC-30S is given in the following pages.





RMC-30S

ACCESSORY STUDIO UNIT



MARTI Electronics, Inc. PO BOX 661 CLEBURNE, TX 76031	DRAWING NO	REV.	DATE	APPROVED	USED ON	TITLE
	800-133-2		6-16-81		RMC 30S	CONTROL LOGIC

910-004

PARTS LIST
RMC 30S
ACCESSORY LOGIC ASSEMBLY

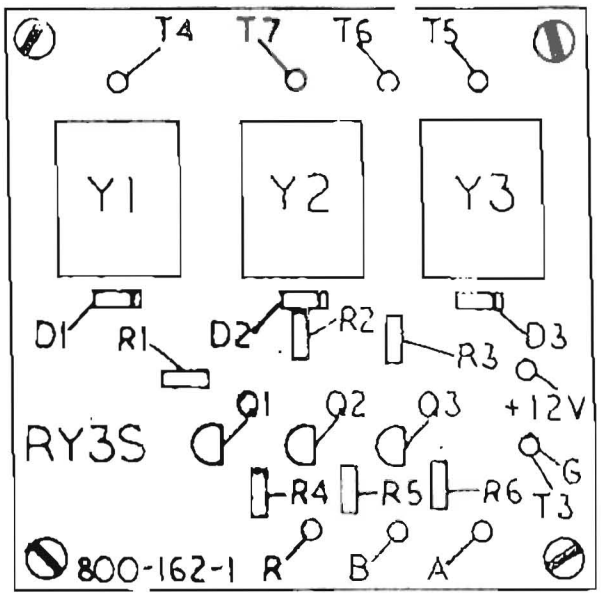
REF.	MARTI P/N	DESCRIPTION
B1	800-133-2	PC Board, Accessory Studio Logic Board
B2	800-132-4	PC Board, Channel Display Board
C1	219-251	Capacitor, 220 uF 25V
D1-D8	410-914	Diode, Silicon 1N914/1N4148
I(A11)	414-209	LED, Red TIL-209A
R1-R4	145-030	Resistor, 3.3 ohm 1/4 W
R5	145-561	Resistor, 560 ohm 1/4 W
R6	145-030	Resistor, 3.3 ohm 1/4 W
R7	145-561	Resistor, 560 ohm 1/4 W
R8	145-030	Resistor, 3.3 ohm 1/4 W
R9	145-561	Resistor, 560 ohm 1/4 W
S((0-15)-30)	530-048	Switches, 16 Interlocking
S(16-18,A/B)	530-050	Switches, 8 DIP (2 Positions not used)
S(19-22,A/B)	530-050	Switches, 8 DIP
S(23-26,A/B)	530-050	Switches, 8 DIP
S(27-30,A/B)	530-050	Switches, 8 DIP
U1,U2	404-148	TTL IC, 74148

RY3S RELAY BUFFER DESCRIPTION

The RY3S Relay Buffer is an optional board for the RMC-15S. When installed, the Status and Alarm conditions are externally available. When the LED indicators on the front panel of the Studio Unit, RMC-15S, are illuminated, the appropriate contacts of the RY3S are closed. The contacts on the rear of the Studio Unit then reflect the conditions that are selected on the rear of the Transmitter Unit, RMC-15T.

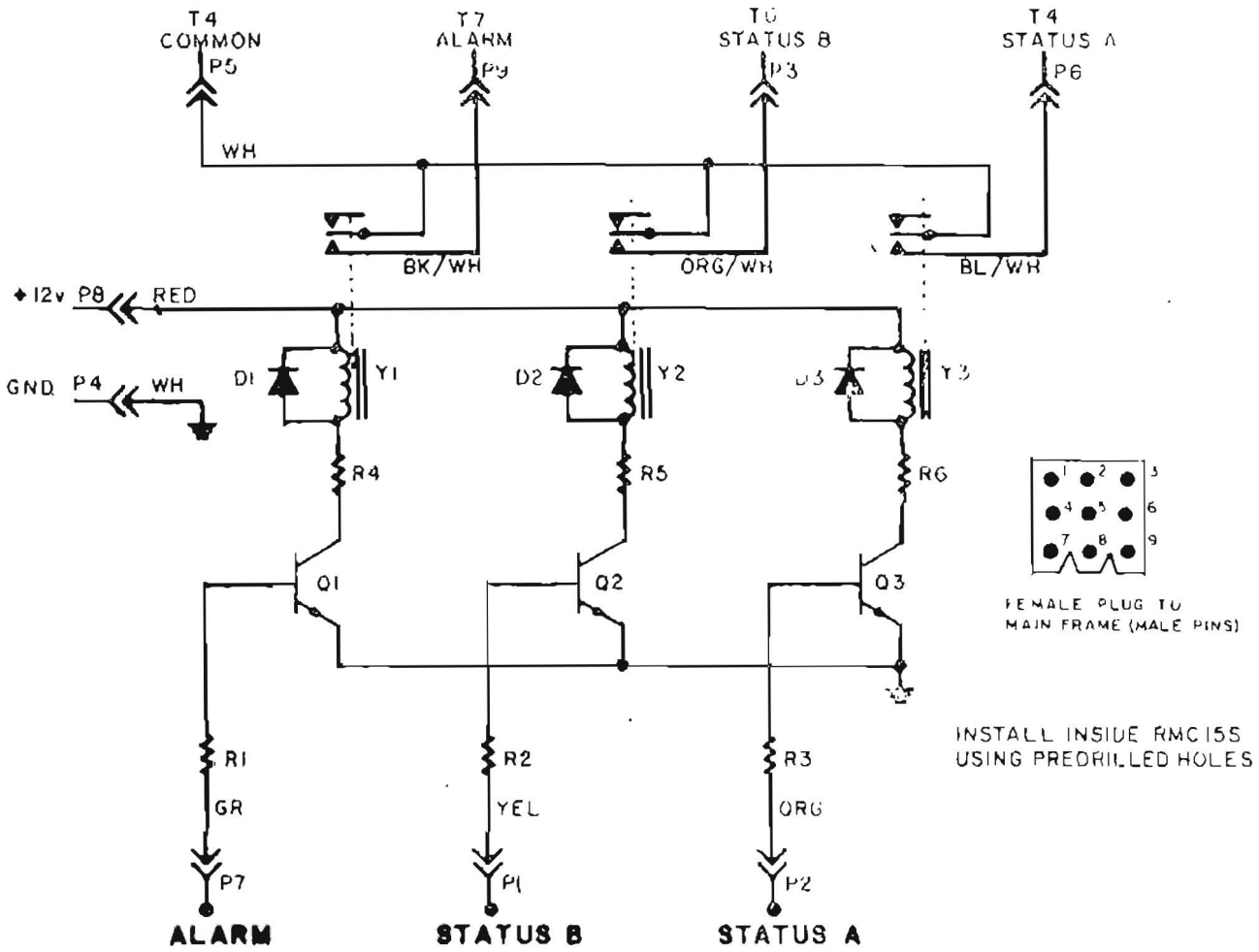
INSTALLATION

Mount the assembly within the Studio Unit, RMC-15S, in the four holes provided. Attach the 9 pin connectors. Test by grounding the appropriate terminals on the rear of the Transmitter Unit. In addition to the LED's on the Studio Unit being on, the "COMMON" terminal should short to the "STATUS A", "STATUS B", or "REMOTE ALARM" terminals on the rear of the Studio.



PARTS LIST
RMC 15S
RY3S RELAY BUFFER

REF.	MARTI P/N	DESCRIPTION
B1	800-162-1	PC Board, RY3S
D1-D4	410-914	Diode, Silicon 1N914/1N4148
Q1-Q3	425-301	Transistor, NPN 2N3904
R1-R3	145-680	Resistor, 68 ohm 1/4 W
R4-R6	145-222	Resistor, 2.2K 1/4 W
Y1-Y3	570-032	Relay, 1 PDT, 12V AZ4UP-ICH-12D



MARTI Electronics, Inc. PO BOX 661 CLEBURNE, TX 76031	DRAWING NO 800-162-1	TITLE RY-3S RELAY BUFFER

910 004

SUBAUDIBLE INSERTION BOARD DESCRIPTION

The Subaudible Insertion Board is a pad used to mix subaudible telemetry from Type C systems with program audio prior to an AM modulator or SCA generator. When the relay is enabled by the remote control, the audio is attenuated to cause a slight reduction in modulation level. This allows the subaudible telemetry signal to be injected without causing 100% or over-modulation.

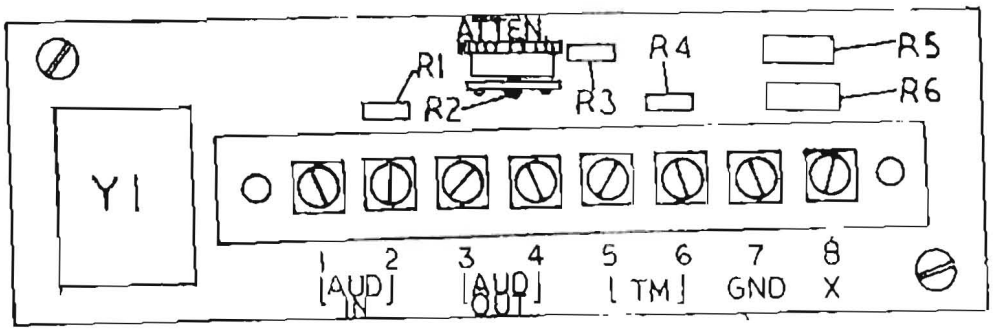
INSTALLATION

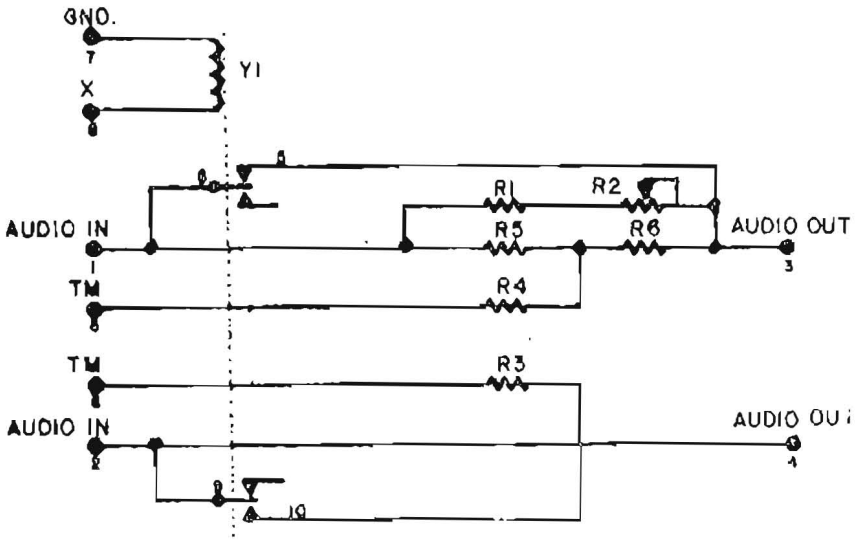
Mount the insertion board in a convenient location, usually within the rack cabinet. To further minimize RF problems, use shielded cables. Keep them as short as possible. Connect terminal 7 to the Ground terminal of the remote control transmitter unit, RMC-15T, terminal 8 to the Common terminal, and terminals 5 and 6 to the 600 ohm terminals of the remote control transmitter unit. Connect terminals 1 and 2 to the audio line previously connected to the AM modulator or SCA audio input. Connect terminals 3 and 4 to AM transmitter audio input or SCA audio input.

With no program audio, set the subaudible carrier level using the station modulation monitor. This is 6% on an AM station and 25% (1 KHz. deviation) on an 67 KHz. subcarrier. Do not depend on the output indicator of the remote control because this indication may or may not be appropriate. Restore normal program audio and adjust the "ATTEN" pot on the insertion board for 85% maximum negative peaks on the AM station monitor or 85% (3.4 KHz. deviation of the FM SCA). In channel zero, modulation characteristics should be normal.

PARTS LIST
RMC 15T
SUBAUDIBLE INSERTION BOARD

REF.	MARTI P/N	DESCRIPTION
B1	800-105	PC Board, Subaudible Insertion Board
R1	145-100	Resistor, 10 ohm 1/4 W
R2	100-501	Resistor, Variable 500 ohm
R3,R4	145-681	Resistor, 680 ohm 1/4 W
R5,R6	105-101	Resistor, 100 ohm 1/2 W
Y1	570-009	Relay, 12V 165 ohm





MARTI Electronics Inc. PO BOX 661 CLEBURNE, TX 76031	DRAWING NO 800-105	TITLE S.A. INSERTION BOARD

TA-66 TUNED AMPLIFIER DESCRIPTION

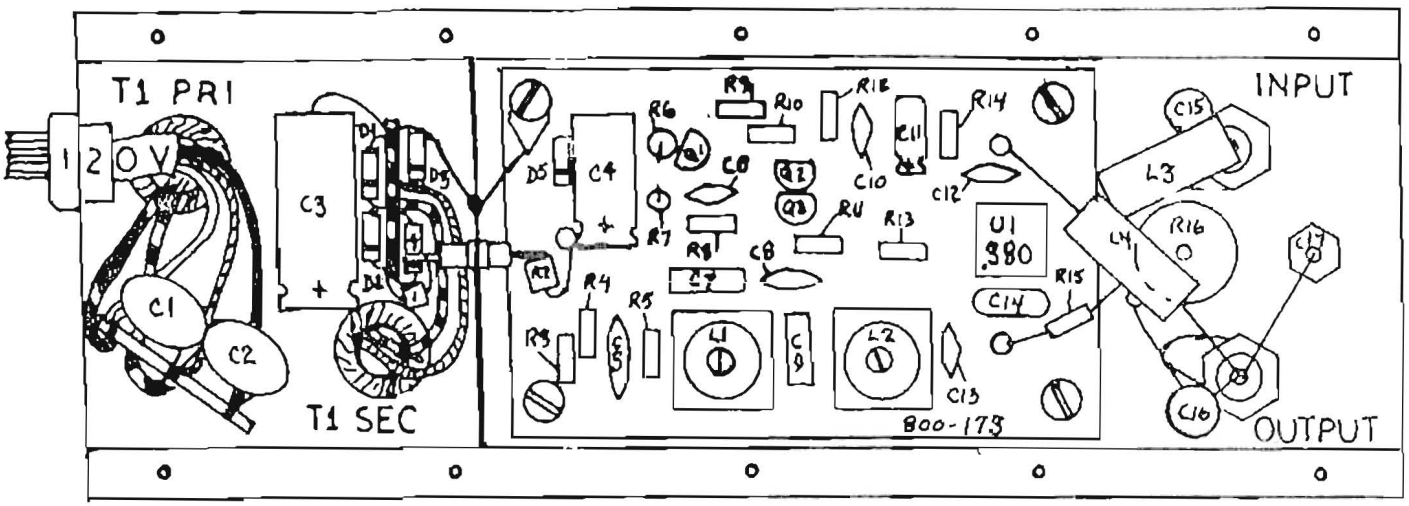
The TA-66 is designed to be used at relay points in a multi-hop control link. Through the Marti STL System the 66 KHz. Control tones are attenuated. The TA-66 re-establishes a level necessary for proper injection on the next link. The Remote Control Transmitter Unit, RMC-15T, contains similar gain circuitry.

Varieties of the TA-66 are used for other purposes. Such units are given a number or letter suffix as a key to their use.

INSTALLATION OF TA-66 AT STL RELAY POINT

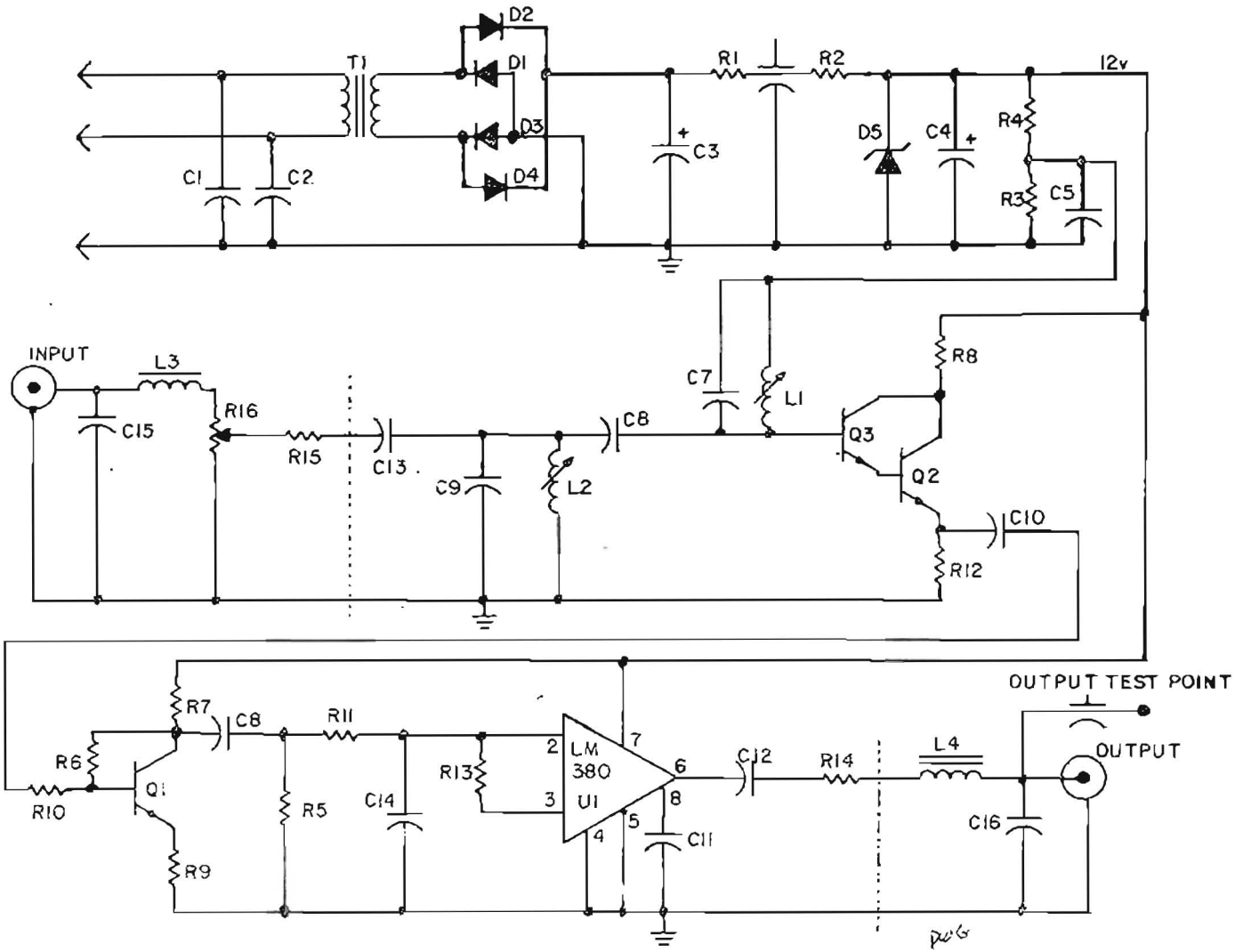
Connect the provided 3' coax from J2 or J3 of the Marti STL Receiver to the Input of the TA-66. Connect another length of coax from J1 or J2 of the Marti STL Transmitter to the Output of the TA-66. Turn the Input gain control of the TA-66 fully counterclockwise before applying 120VAC. Connect an AC voltmeter between the output test point on the TA-66 and chassis ground. After applying line voltage to the TA-66 adjust the output level to 0.5VAC or at a level specified for 20% injection. If no output is detected, make sure that the 66KHz. is being injected at the preceeding STL site.

The characteristics of the TA-66 allow more than 2-hop links. The procedure for installation at each site is the same.



TA-66

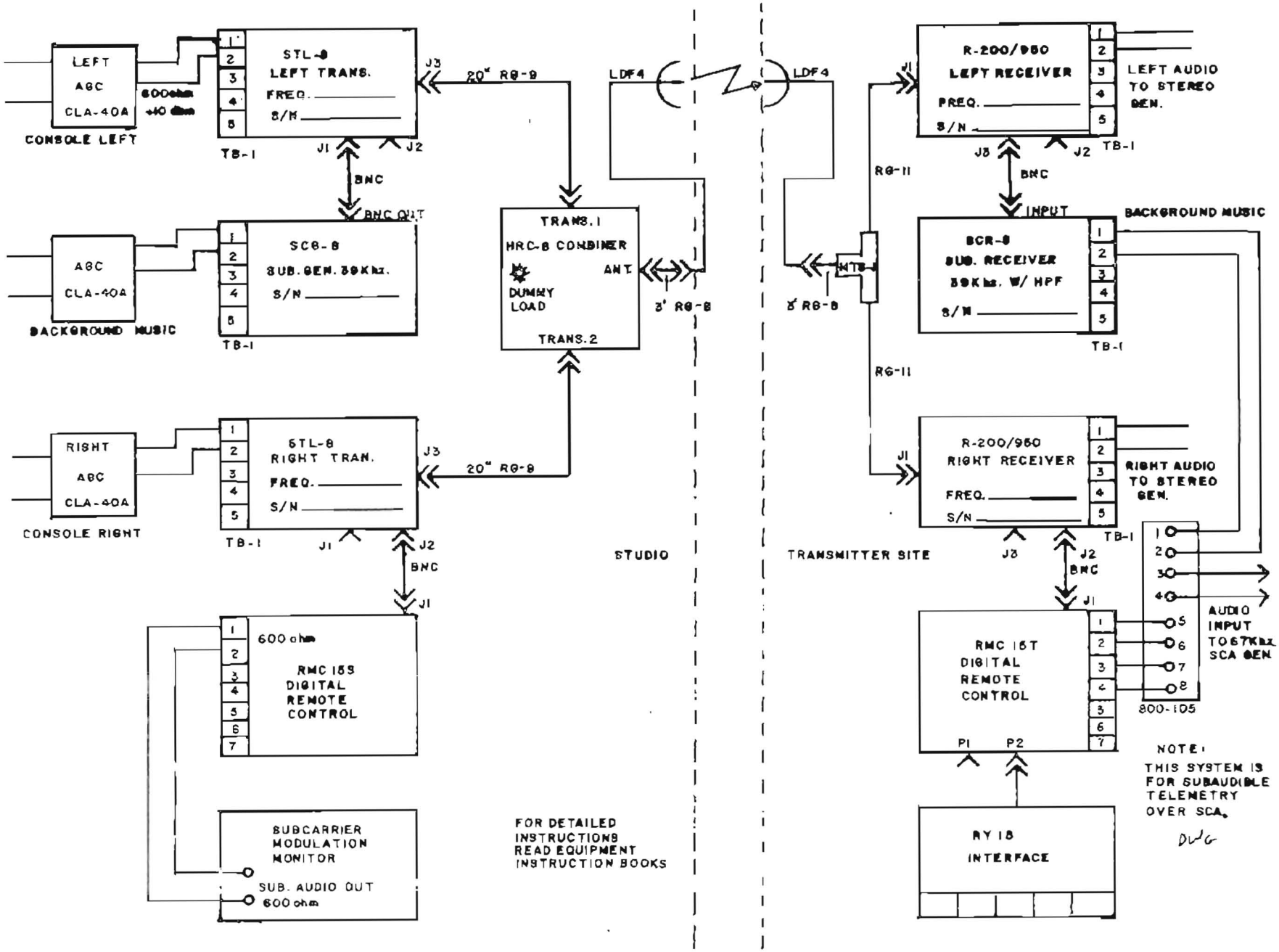
66 KHZ TUNED AMPLIFIER



MARTI Electronics, Inc. PO BOX 661 CLEBURNE, TX 76031	DRAWING NO	REV.	DATE	APPROVED	USED ON	TITLE
	800-173		6-12-81		TA-66	TA-66 TUNED AMPLIFIER

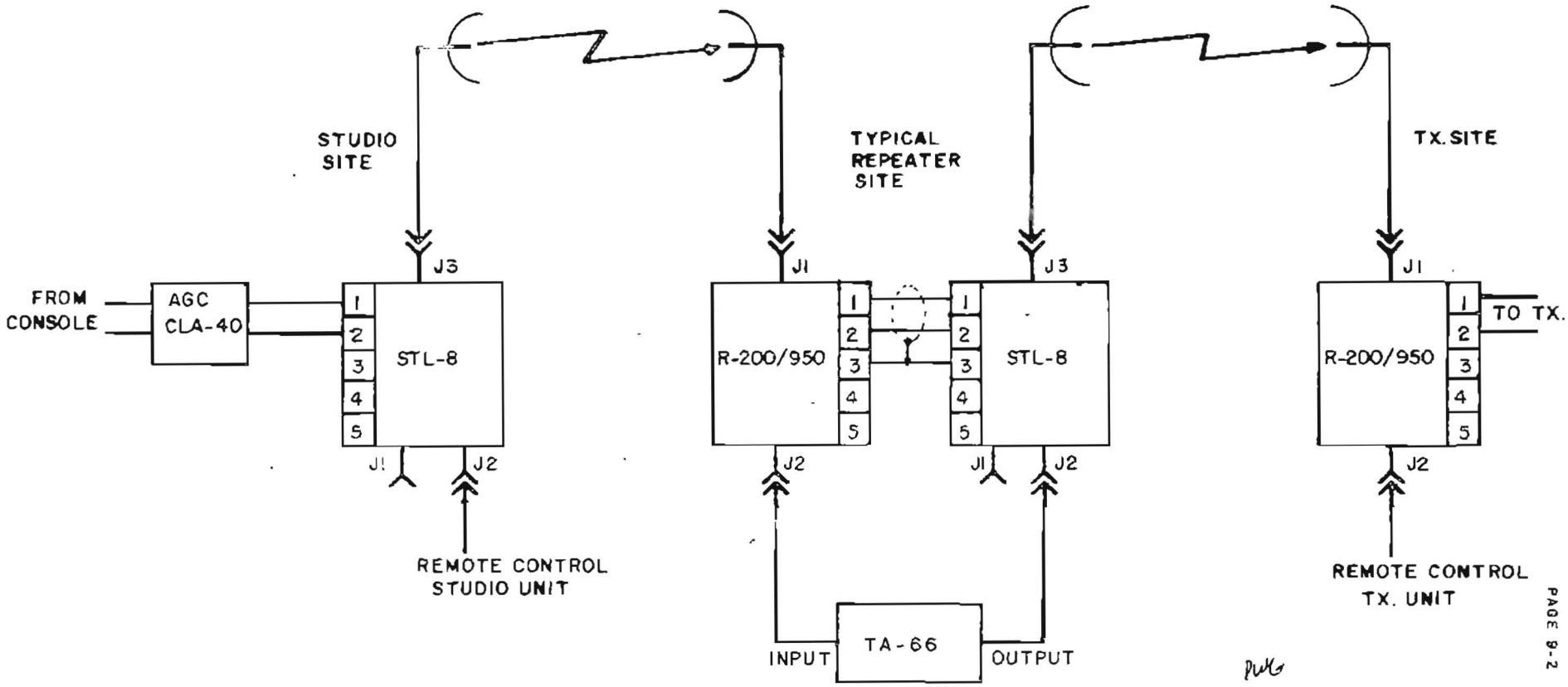
PARTS LIST
TA-66 TUNED AMPLIFIER

REF.	MARTI P/N	DESCRIPTION
B1	800-173	PC Board, TA-66
C1,C2	297-202	Capacitor, .0022 uF Type AU
C3	219-401	Capacitor, 470 uF 40V
C4	219-251	Capacitor, 220 uF 25V
C5	217-103	Capacitor, .1 uF Discap 25V
C6	217-104	Capacitor, .01 uF Discap 25V
C7	215-202	Capacitor, 2000 pF polystyrene
C8	256-131	Capacitor, 130 pF Disc
C9	215-202	Capacitor, 2000 pF polystyrene
C10	217-104	Capacitor, .01 uF Discap 25V
C11	219-200	Capacitor, 22 uF 25V
C12	217-104	Capacitor, .01 uF Discap 25V
C13	256-471	Capacitor, 470 pF Type JL
C14	255-161	Capacitor, 160 pF Mica
C15,C16	256-471	Capacitor, 470 pF Type JL
D1-D4	414-007	Diode, Silicon 1N4007
D5	410-120	Diode, Zener 1N4742
L1,L2	350-035	Coil, Slug 3000 uH
L3,L4	330-004	Choke, 100 uH
Q1,Q3	425-301	Transistor, NPN 2N3904
R1,R2	105-101	Resistor, 100 ohm 1/2 W
R3,R4	145-102	Resistor, 1K 1/4 W
R5	145-223	Resistor, 22K 1/4 W
R6	105-274	Resistor, 270K 1/2 W
R7	145-681	Resistor, 680 ohm 1/4 W
R8	145-470	Resistor, 47 ohm 1/4 W
R9	145-030	Resistor, 3.3 ohm 1/4 W
R10,R11	145-223	Resistor, 22K 1/4 W
R12	145-103	Resistor, 10K 1/4 W
R13	145-105	Resistor, 1 Meg 1/4 W
R14	145-470	Resistor, 47 ohm 1/4 W
R15	145-473	Resistor, 47K 1/4 W
R16	100-103	Resistor, Variable 10K
T1	320-022	Transformer, Power 12-20V Sec
U1	400-380	Linear IC, LM380



MARTI Electronics, Inc. PO BOX 661 CLEBURNE, TX 76031	DRAWING NO	REV.	DATE	APPROVED	USED ON	TITLE
	701-000	A	4-7-81			STEREO STL SYSTEM BLOCK DIAGRAM

910-004



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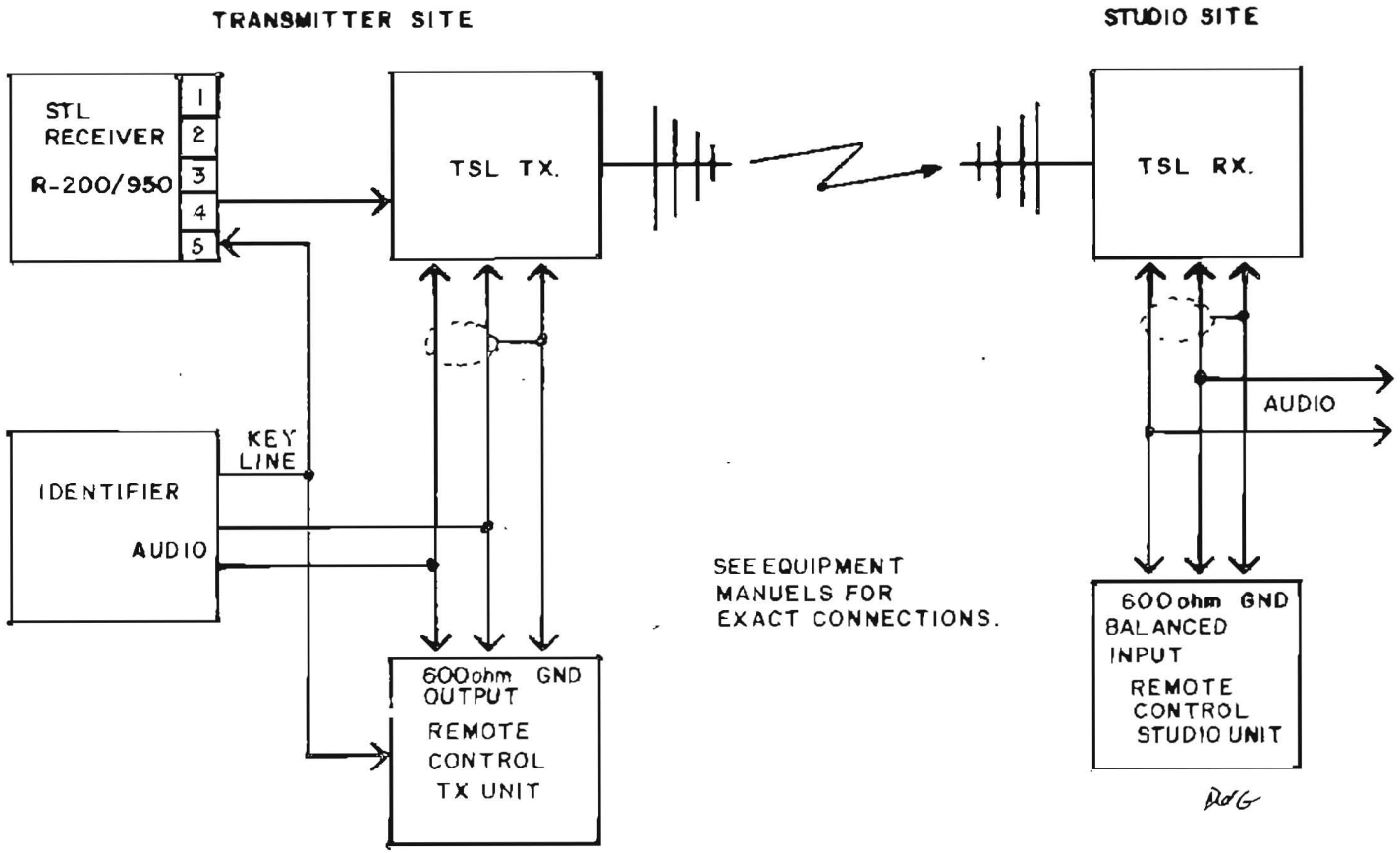
MARTI Electronics, Inc. PO BOX 661 CLEBURNE, TX 76031	DRAWING NO	REV.	DATE	APPROVED	USED ON	TITLE
	702-024		6-15-81			MULTI-HOP CONTROL

910-004



MARTI Electronics, Inc. PO BOX 661 CLEBURNE, TX 76031	DRAWING NO	REV.	DATE	APPROVED	USED ON	TITLE
	702-025		6-15-81			TSL TELEMETRY

910-004